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REFLECTIONS ON THE ETIOLOGY OF RICKETS.*

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If we survey the history of medicine we cannot but be impressed by the fact that almost every generation has its predominant medical interest. The role played by infection has been a conspicuous one since the time of Pasteur and continues so to the present. But within the last decade nutrition and nutritional disturbances have become the nucleus of medical interest. The reason for this is not hard to find. With the advance of civilization there is a constant effort exerted to conserve and to emphasize the importance of the minimal. The recent World War affords a striking example of the part played by nutrition in maintaining national health and vigor, when we consider that faulty nutrition and not, as in previous wars, infection, proved to be the crucial problem of the conflict. The discovery in 1911 of the vitamine (1)added fresh interest to the subject, for it disclosed a new group of dietary factors vitally important for the welfare and existence of the human race.

Ever since Glisson (2) in 1659 published his report on the symptomatology and incidence of rickets, there has been widespread interest in its etiology. This interest has been sustained rather than active, for the investigator of the rickets problem was at once bewildered and seemingly hopelessly confused by the multiplicity of theories concerning its etiology. It is not my intention to run the gamut of these theories, but I shall confine myself only to pointing out the more important and promising facts which now, as the result both of laboratory and clinical investigation, stand out as landmarks in the advance of this difficult and fascinating problem.

Before discussing etiology, it will be necessary to answer the question: "What is rickets?" To pediatricians this may seem an unnecessary question to put, we are, nevertheless, finding it increasingly difficult to define rickets satisfactorily—and this difficulty becomes constantly greater as our knowledge broadens. In answer to that question I can do no better than to quote Park (3) of Yale who defines rickets as a "disturbance in the metabolism of the growing organism of such nature that the salt equilibrium, in particular as regards the calcium and phosphorus, in the circulating fluids is disturbed, and lime salts no longer deposit in the bones." Indeed an excellent definition, but one that does not fulfill the requirements of *clinical* standards..

We are all perfectly familiar with the cardinal signs and symptoms of this disorder and I will refer only to the roentgen-ray diagnosis as one of the significant advances of the last few years. Even this method has been found, like almost all diagnostic procedures, to have important limitations. In furnishing information as to the earliest beginnings of rickets, the X-ray is found to lag behind clinical examina-

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tion. I make this statement after an experience embracing several hundreds of roentgenograms of the wrists, checked by clinical findings. Altho this tardiness on the part of the X-ray may seem most improbable, it must be borne in mind that we have to compare the picture of the wrists with clinical changes noted at the costo-chondral junctions, for here the rachitic rosary or beading is found frequently to precede the changes in the epiphyses of radius and ulna as demonstrated by the radiograph. I might add that it is quite easy to distinguish roentgenographically between active rickets and healing or healed rickets. This we cannot always do clinically. Another laboratory procedure, which will be referred to later, is diagnostic in this connection.

Theories regarding the etiology of rickets have been in the past based almost entirely on hypotheses or on general impressions gained by clinicians in the course of their medical practice. They have been all-embracing, incriminating errors of diet, of hygiene, faulty metabolism, inactivity of the endocrine glands, bacterial invasion, etc. It was not until the laboratory worker took up the problem of investigating rickets in the experimental animal that significant facts began to crystallize out.

The classical experience of Bland-Sutton (4) in the London Zoological Gardens should long ago have lighted the way, but his work went practically unnoticed. He demonstrated the remarkable power of cod-liver oil in preventing rickets in caged lion cubs when he added that substance to an otherwise unchanged and apparently rickets-producing diet.

A good many years later Mellanby (5) another Englishman, carried out the first serious and prolonged investigation of rickets in animals on controlled and restricted diets. His purpose was to prove that rickets is a dietary deficiency disease in which the vitamin Fat-soluble A constitutes the deficiency. Without going into the details of his work, suffice it to say that by eliminating as far as possible, this vitamin from the diets of a large series of puppies, he was able to produce, to his own satisfaction and that of the British Medical Research Council, rickets in these animals The Council accepted his conclusions and published them in its report on the Accessory Food Factors. That subsequent investigators have failed signally in corroborating the work of Mellanby does not retract from its value as constituting the first great landmark in the investigation of this disorder from the standpoint of the diet. Those who do accept Mellanby's work and refer to rickets as a vitamin-deficiency disease are at once confronted by this clinical paradox: Given 20 babies in a ward of a child-caring institution, all free from disease, all on diets which are quantitatively as well as qualitatively identical, hygiene, fresh air, sunlight and all other factors identical—10 develop rickets, 10 do not. If there were a vitamin deficiency in the diet, *all* should become rachitic; if there were no deficiency, *none* should develop rickets. This fact has led some to believe that heredity is the determining factor; if both parents were rachitic, all their children will become so; if only one parent, half the children; if neither parent, all the children will escape it. But this again is not the case. Whereas it is true that there does seem to be a familial tendency to the disease, we must remember that most rachitic babies are of the slums and it is the slums that is inherited.

More recently the rat has been extensively employed as the experimental animal and posesses many obvious advantages over the dog. The almost simultaneous and quite independent observations of Sherman and Pappenheimer (6) and of McCollum and his associates (7) have shown that rickets can be produced at will in the rat by a diet deficient in inorganic phosphorus, and that if this salt be added to the dietary in sufficient quantity, rickets fails to develop. However striking and conclusive the experiments may be, it is at once apparent that in the light of clinical experience they cannot indicate that infantile rickets is merely dependent on a deficient phosphorus supply, for we know that cow's milk contains approximately five times as much phosphorus as woman's milk and yet we see rickets far more frequently in the bottle-fed baby. Furthermore I have shown recently (8) that the woman's milk upon which the baby develops rickets has the

same inorganic phosphate content as that upon which the baby thrives normally.

These experiments on the rat are, however, of the greatest importance for we find their clinical analogue in the work of Howland and Kramer (9) who report the inorganic phosphate contents of the blood serum markedly reduced in babies with active rickets, and this finding I (8) have, among many others, corroborated. Furthermore Hess and Gutman (10) have, shown that this constituent of the blood rises as the rickets heals. To this group Howland has given the name "low-phosphorus Rickets", as contrasted with other cases in which the blood shows a slightly reduced calcium content, which he calls "low-calcium rickets." In the experimental animal, however, a low calcium diet leads not to typical rickets but to osteoporosis.

Let us leave for a moment the salt constituents of the diet and turn to the knowledge we have gained from a therapeutic measure, namely the administration of cod-liver oil. A great many years ago Kassowitz recommended the use of cod-liver oil in the treatment of rickets and he combined with it phosphorus. His use of it was entirely empirical. The followers of Mellanby use it because it was found to contain in highest potency what they call the "anti-rachitic vitamin." We use it because we know that it increases calcium and phosphorus retention in the body and above all because it is a *specific curative* and *preventive* of *rickets.* What is the substance in cod-liver oil that cures rickets? Several attempts have been made to isolate the chemical substance, the nearest approach being that of Zucker and his associates (11) who demonstrated that the anti-rachitic substance lay "in the ether-soluble, unsaponifiable fraction after alkaline hydrolysis." Let us call that substance X and ask ourselves: are there any other foods containing it? Butter fat and green vegetables probably contain it, tho in such small amounts that they have no therapeutic value as ordinarily given to infants. There is perhaps no more striking example of a cure than that which follows the administration of cod-liver oil and which can be beautifully seen in serial X-ray pictures of the epiphyses of the long bones.

In 1919, Huldschinsky (12) reported that the ultra-violet ray exerted a curative action in rickets, tho he had been preceded by Palm (13) who in 1890 appreciated the value of sunlight and was a staunch exponent of its use for the eradication of the disease. Later Raczynski (14) in 1912, wrote "that it is the sun which plays the principal role in the etiology of rickets" and supported his claim with studies on the mineral metabolism of puppies as influenced by sunlight. This work has more recently been confirmed by a host of investigators and the curative action of the sun's rays has been demonstrated by the X-ray, blood chemistry and clinical examination. Huldchinsky's discovery that it is the ultra-violet end of the sun's spectrum which causes lime salts to be deposited in the bones has received abundant corroboration both here and abroad.

Hess and Ungar (15) have made use of the ultra-violet rays of the carbon arc light to prevent and cure infantile rickets, and these investigators together with Pappenheimer (16) were successful in preventing rickets in the rat by exposures to the mercury vapor quartz lamp. X-ray therapy has failed to exert a similar curative action.

Of what significance are these cures in the consideration of the etiology of rickets? Let us see. Rickets, as is well known, occurs mostly, if not exclusively, in the winter months when babies are largely deprived of sunlight. Furthermore the sun's rays are not as intense, nor do they contain the same quantity of ultra-violet rays in winter as they do in summer. Hess and Lundagen (17) have very recently shown in a chart, derived from the New York Meteorological Observatory, that the Sun's spectrum contains in arbitrary units zero units ultra-violet rays in November, December, January and February and 1000 units in May, June and July. I reproduce here the chart taken from the above quoted article.

These ultra-violet rays in order to be effective must penetrate, and they do penetrate, the skin. And so we find here the probable explanation of the fact that negroes with their deep pig-

ment layer beneath the skin and the dark-skinned Italian are so prone to rickets when removed from their natural habitat. In Africa the negro goes about naked and obtains the maximum beneficial effect of sunlight and rickets is there unknown. In sunny Italy the Italian, likewise, spends most of his time out of doors and rickets is rare. When these peoples, however, come to a temperate zone, as in this country, are forced to wear clothes and are closely housed, they lose the protective action of the sun to a very great extent and almost 100 per cent of negro and Italian babies in the north develop rickets. Cod-liver oil can, however, take the place of sunlight in preventing and curing rickets, for, as mentioned above, it exerts the same influence over the mineral metabolism of the body as do the sun's rays.

In the consideration of the pathology of rachitic bones and cartilage there would seem to be four possibilities to account for the failure of proper ossification. First, that there is a deficient calcium supply in the diet or a failure of absorption of a sufficient supply; second, that there is an alteration of the form of the blood calcium, making it less available for the normal formation of bone; third,, that there are absent intermediary products, possibly of the ductless glands, possibly of salts, particularly phosphates, which are necessary for the deposition of calcium in the bones; and fourth, that there is an alteration, chemical or structural, in the osteoid tissue and provisional cartilage cells or matrix, such that calcium, even tho it may be supplied in sufficient and proper form by the blood, cannot be taken up by these cells. Or there may be a combination of any or all of these possibilities.

That there is no deficiency in the diet of calcium we know to be true for the artificially fed baby, and I am now investigating the calcium contents of woman's milk in connection with rickets. My results will be reported later. To the second possibility, namely, that there is an alteration in the form of the blood calcium, I (18) directed particular attention two years ago while working in the pathology laboratory of Columbia University. I found that there was no alteration in the normal relation between dialyzable or available calcium and the non-dialyzable or protein-combined calcium in the blood serum of infants with active rickets. The third possibility is now under critical investigation in many laboratories throughout the country, while the fourth has not been touched upon.

A great many attacks have been made on the endocrine glands as causative factors, but mostly with negative results. Recently, however, Pappenheimer and Minor (19) have shown in a large series of cross-sections of parathyroids of rachitic and non-rachitic infants, that there is a very definite hyperplasia of these bodies in the rachitic cases. Studies of the thymus, thyroid and other ductless glands have led to no positive conclusions. What significance this parathyroid hyperplasia in rickets may have we are not in a position to state at the present time.

I have said nothing about predisposing and contributory causes of rickets and I will only mention that prematurity is the foremost of these. As regards congenital rickets, I think we are now in a position to state that it does not exist, for Schmorl (20), the greatest pathologist of our times, investigated the ribs and long bones of the extremities of more than 100 infants born either at term or prematurely, without once finding evidences of the disease. The earliest age a which he was able to find rickets was one and one-half months.

To sum up: we can say that the greatest advance in the rickets problem has emanated from the laboratory within the last half-decade; that investigations both here and abroad are bringing more sharply into focus the importance of sunlight and the ultra-violet rays of artificial light and the substance or substances in cod-liver oil which exercise such a profound influence over the calcium and phosphorus metabolism of the body.

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HEADACHES WITH REFERENCE TO SOME PHASES OF REFRACTION.

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The eye, as an optical instrument may be said to consist of a nearly rigid spherical capsule with a bull's eye (the cornea) in front, the capsule being filled with a liquid of uniform optical density (the aqueous humor and the vitreous), in which is suspended a lens of adjustble focus. Between the bull's eye lens in front and the suspended lens behind is stretched a diaphragm (the iris), which acts as a stop to cut off the peripheral, irregularly refracted rays. This stop works automatically, its aperture (the pupil) contracting whenever the illumination becomes too intense, and dilating when the illumination becomes too feeble. The lens is made up of strata varying in optical density from depth to depth. If in such a structure we connect all the points whose index of refraction is equal, we get what is called an isoindicial substance.

The function of the refractive media of the eye, which form a part of the enveloping or protective system of the latter, is so to conduct and concentrate the light that impinges on it as to set up appropriate stimuli in the sensory organ proper (the retina). The eye which is composed of these two struc-

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tures, one subserving nutrition, protection and conduction; the other subserving sensation constructed upon the principle of a camera obscura. This consists of a box, blackened on the inside, the anterior wall of which contains a strong convex lens, which throws upon the posterior wall an inverted image of the objects that happen to be in front of the camera. In the human eye, we find instead of the convex lens quite a number of refracting substances, namely the cornea, aqueous humor, lens and vitreous and instead of the posterior wall, the retina which not only receives the image, but at the same time perceives it.

Hence a diminution of visual power may be produced by two different causes; either the conductive apparatus of the eye is defective, so that a sharp image is not thrown upon the retina, or that retina (the sensory) is at fault so that the image is not properly perceived.

In order to throw a sharp image upon the retina, the conductive apparatus of the eye must fulfill two conditions. In the first place, the refracting media must be perfectly transparent; hence opacities of the cornea or lens, changes in the consistency of the aqueous or vitreous, make distinct vision impossible. The second condition is that the refractive power of the media be such that they project an image of external objects which is both perfectly distinct and lies at the same time precisely upon the retina. The variations from this rule, we designate as errors of reflection and accomodation or Ametropia.

Headaches may emanate from the eyes, even when the eyes are not really diseased but simply subjected to strain as in ametropia. The physician should should always think of the eyes as a cause in frequent headaches especially if there is nothing in the history of examination in general to account for them. The headache is easily recognized as a Eye Headache if the eyes are inflamed, styes, weeping, sensitive to light or to pressure; but in those cases of headache, in which the eyes present no external signs, are due to errors of refraction, mainly hyperopia, astigmatism; anomlies of accomodation, or disturbance of muscular equilibrium. These headaches come on after undue or prolonged exertion of the eyes. They are usually relieved by sleep, but in some cases are present upon first awakening, if after prolonged use of the eyes the night before. They are infrequent in young children, but present themselves in the study age from 10 to 20 years, when to the stress added by study are added the nervous disturbances caused by the developmental growth of the body as well as the eye.

Another form of headache is the Panorama headache brought on by looking at a series of moving objects and is usually due to uncorrected errors of refraction.

Neurasthenics may have headaches referred to the eyelids, to the eyes, or behind the eyes due to eye strain and they may be brought on by even slight exertion of the eyes and are not brought on by prolonged use of the eyes as in errors of refraction.

Another form of headache is the headache of Prodromal glaucoma, and it is this terrible disease which usually comes on so insidiously and progresses so gradually, that the patient may not be aware of anything but failing sight, and seek attention after it is too late. This disease (Glaucoma) is hardening of the eyes, increase in tension until optic atrophy and blindness set in for which there is no cure. It is therefore essential that the general man be on the lookout for this disease, as it is to him they first come for the relief of the headache, in the early stages. The headaches come on in the afternoon or evening and may be brought on by any excitement as shopping, company, theatres, etc. It is usually relieved by sleep, but may be so severe as to prevent sleep. If seen after the attack the eyes will usually reveal nothing; but when seen in the attack, the striking shallowness of the anterior chambers will be noted. In their absence a careful and precise history can be elicited especially if the attacks have gone on for some time. The headaches are almost absent in summer, but recur in winter; infrequent at first, but recurring more frequent, severe and of longer duration. The headaches are associated with a clouding of sight, and the appearance of colored rings or haloes around electric or candle light. The last symptom cannot be laid too much stress on. We may find typical glau-

comatous excavations of the optic nerves and arterial pulsation of the central retinal artery upon slight digital pressure. It is amazing the relief that can be obtained within 15 to 30 minutes by the instillation of a 1-2 per cent eserine or a 1 per cent pilocarpine solution in the eyes. In these cases of headaches due to glaucoma, we do not prescribe glasses, but we make them stop all near work if possible, and these cases have to be under observation of an oculist often for years if we use therapeutic measure as miotics, and then if these fail to control the attacks, operative measures may have to be instituted.

Asthenopia or weak sight may be defined as a sense of strain and weariness that is set up by the use of the eyes, and the patient describes it as the eyes give out. It may occur alone, Asthenopia simplex; with pain, Asthenopia Dolens; with headaches Asthenopia Cephalalgica; with irritation, redness and burning of the eyelids Asthenopia Irritans. In Asthenopia Cephalalgica, the headaches may be accomodative, errors of refraction, hyperopia and astigmatism; or muscular disturbances of the exterior muscles of the eye; neurasthenia; photogenous, caused by excessive or improper illumination; or reflexly produced by morbid conditions of other organs as the nose and its accessory sinuses, teeth et cetera.

The asthenopic headaches due to errors of refraction or muscle disturbances are the commonest of all eye disorders and the symptoms are most amenable to treatment, either by the correction of the refraction or by eye hygiene as proper working illumination or removing the cause of the asthenopia. The types of the various errors of refraction and how they produce headaches will be taken up more in detail.

Emmetropia or normal sightedness is that condition in which the eyes can focus either for far or near and cause the points of the object to be clearly and distinctly received and precisely placed upon the retina without the aid of a correcting glass. Only 15 per cent of eyes are this way at birth, and at the age of 20 the number has reduced to about 5 per cent after the development of the eye has been completed. This shows what a small per cent of the eyes are actually normal, but not all abnormal eyes give trouble.

Hyperopia or farsightedness of the eye which is shorter than the normal eye. 80 per cent of infant eyes are hyperopic at birth and as the eyes grow with the rest of the body, at about the age of 20 the number is reduced till about 48 per cent. The eye of the newborn is very short in length; the cornea has about the same curvature as that of the adult but the lens has almost twice the curvature of that of the adult. This and the short diameter account for the hyperopia.

The rays coming from infinity or parallel, but which in our tests we use a distance of 20 feet, do not focus on the retina but are carried behind it due to the shortness of the eye, in a hyperopic eye. To see for far or near they must accomodate. Accomodation may be described as the ability to focus for near and it is commonly accepted as being brought about by the action of the ciliary muscle which contracts and allow the lens to become more convex. This brings the rays more sharply to a focus, or a nearer focus. The more the lens becomes curved or convex, the nearer the focus.

A normal eye must accomodate to see close by or for near work and the accomodative power of the ciliary muscle increases up to the age of 10 years, and then recedes until between 40 and 45 years of age, it is practically gone. This is why most people need a glass to read with after the age of 40. This age when accomodation is gone is called Presbyopia.

The hyperope has to use his accomodation for far to focus the rays on the retina and he has to use more than a normal eye for near work, so the average amount of accomodation being present in all eyes regardless of their normality or abnormality; he always has a deficit in his accomodation. This is what causes the headaches after prolonged use of the eyes; the tiring of the ciliary muscle.

Myopia or near sightedness, 5 per cent of eyes at birth are myopic and this increases more rapidly until about the age of 16 when it becomes stationary. At this age the percentage of myopes have increased to about the same as hyppropes or 48 per cent. If after the age of 16 the myopia still continues to increase, it is then caled progressive or Pathalogic myopia. The myopic eye

is longer than the normal eye, and consequently objects have to be closer than in the normal or hyperopic eye to be focused distinctly on the retina. If the objects are too far away, the rays come to a focus before the retina is reached and then instead of being perceived as distinct points are seen as blurred ones or what are called diffusion circles. To see better, myopes blink the lids, thus reducing the size of the palpebral aperture, making them slit like. It may be compared to looking at objects thru a pinhole, which even to a normal eye makes objects more distinct. Myopes see very well close by, or near objects; so therefore they require less accomodative power than a hyperope or normal. The result is that Presbyopia is very often delayed or may not be present at all. This explains why some indivi-dauls can live to a very ripe old age, and never require glasses for reading purposes. Individuals who have lenticular changes, early formation of cataracts may become myopic, then they are able to dispense with their reading glasses until the cataracts grow so much as to interfere markedly with vision. Myopes as a rule suffer little with headaches unless the error is large or complicated with astigmatism. It is, however, necessary to correct myopia in youth to prevent any chance of it becoming progressive after the developmental age. For in real progressive myopia the individual is always in danger of complete blindness from myopic changes in the choroid or retina, or from detachment of the retina. In high errors of myopia, the vision may be so indistinct that glasses have to be prescribed for even imperfect vision for far or near.

Astigmatism. All eyes have some astigmatism due to the complicated course all refracted rays take and their consequent failure to focus sharply. That is why a star is always pictured as having several projecting points, while as a matter of fact it is round. In astigmatism all the rays coming from an object do not focus sharply upon the retina at the same time; in hyperopic astigmatism some of the rays fall behind the retina, others directly upon it; in myopic astigmatism some of the rays come to a focus before the retina is reached, and only some reach the retina precisely. Astigmatism may be alone, but in most cases it complicates myopia or hyperopia, and is called compound hyperopic or myopic astigmatism. In other cases, the rays fall both behind and in front of the retina, and not on the retina, and is then known as Mixed Astigmatism.

Astigmatism is also classified into Regular and Irregular; the former is physiologic and it is when the regularity of the objects shape predominates over the irregularities, so the irregularities are negligible and can be corrected with glasses; the irregular astigmatism usually pathologic due to opacities or pathologic changes in the conductive apparatus of the eye, and the images are always distorted as looking through a badly made window pane at objects outside. This form is not corrigible to glasses. An exception to this is the astigmatism that forms after cataract section and is amenable to correction by glasses.

Astigmatism is either congenital or acquired rather early in life. It changes little up to the age of 50, then it may increase or change its axis. Most of the regular astigmatism is due to variations in the curvature of the meridians or axes of the cornea from the average normal curvatures. The principal meridians are based upon the radii of a circle and spoken of as vertical or 90, and horizontal or 180. The lens is less responsible for astigmatism, and is only compensatory for the change in the curvature of the cornea. Astigmatism usually affects both eyes, but not to the same degree, but the principal meridians are symmetrical. Headaches are a very frequent symptom of astigmatism, even in very slight errors at times, and often the headaches are out of all proportion to the amount of astigmatism. This is due to the distortion of vision due to the shape of the diffusion images, none are sharply focused upon the retina. The individual is always trying to see the whole object, but can't and has to use his accommodation to see first one part, then the other parts and this continuous rapid adjustment of the accommodation, tires the ciliary muscle and headaches ensue. This is very true if prolonged use of the eyes is resorted to. The treatment is by refraction and eye hygiene.

Each eye has six muscles externally and these are supplied by three different cranial nerves, and together the eyes have twelve muscles, some of which are antagonists, others are helpful or increase the action; while still other only act as adjuvants in some positions and are antagonists in other positions. The directions in which the eyes may be moved are so numerous, and the whole muscle system of the eyes are so complicated that one wonders why there are not more cases of headache due to disturbed muscular equilibrium.

When we direct one of our eyes towards an object to see it distinctly as possible, we are said to fix or fixate that object. The macula or fovea centralis is the most sensitive portion of the retina; hence in performing fixation, we normally and unconsciously direct the eye, so that the image falls upon the fovea. In the majority of cases if one eye fixates an object with its fovea, the other eye will do so too. The whole extremely complicated mechanism of muscles and nerves with which the two eyes are supplied is designed primarily to move the eyes that they shall both be directed accurately to the object we wish to see, and that each eye shall receive the image of that object precisely upon the fovea. This is called Binocular Fixation, and the movements of the two eyes are co-ordinated to do this.

In the normal condition, both eyes must not only fixate the object when they are open, but the eyes must be straight when one of the eyes is closed. When one eye deviates when covered, either turning in, out, up or down, this denotes a muscle insufficiency or Heterophoria. The normal muscular equilibrium is called Orthophoria.

In the third class only one eye is straight at a time, even when both eyes are open, and this is called Heterotropia, Strabismus, Cross Eye or Squint.

It is in the second class or Heterophoria (tendency to), or Muscular insufficiency that we have headaches so often, and this is particularly true in the heterophoria of the vertical or oblique muscles of the eyes. We have numerous tests to determine which muscle or muscles are involved, and it is the routine practice of every opthamologist (not the optician or optometrist) to take the muscle balance in refracting cases both before and during the drops, or in cases where he believes the headaches to be due to muscular imbalance. This information is used in the basis of prescribing glasses, which may be accompanied by muscle exercises or the exercises alone to strengthen the weakened muscles.

In the Heterotropias or Squints, they usually appear mainly in childhood during the developmental age, and especially after an infectious toxic or contagious disease, but produce little headaches, for the child soon learns to disregard the improperly focused image with the deviating eye, and only uses the non-deviated eye. This is why the deviating eye becomes amblyopic or decreased vision due to non-use. It is essential to refract these children early, not for the symptoms, but to preserve the vision in the deviating eye, and very often glasses may correct the physical defect without operative measures. Very aften the vision in the deviating eye may be improved by covering the good eye, thus making the deviating eye bear the brunt of seeing, and thus develop its power.

Strabismus coming on suddenly in adults is usually paralytic and in the idiopathic cases most of them are luetic. They suffer with headaches because of the diplopia, due to the improperly focused images of the deviating eye. Refraction is not indicated in these cases until after some months, for the deviation is often corrected by removing and treating the cause.

In squint coming on after the loss of almost all or entire sight in one eye, is the effort of Nature to throw out the disturbing elements so that the good eye will not be bothered, with the blurred and faulty image of the poor seeing eye. This squint gives no trouble and cannot be corrected by refraction and only approximately by operative methods.

These are only a few of the disturbances of refraction, accommodation or muscular equilibrium which may produce headaches, and nearly every physician knows the miraculous cures affected by proper refraction and hygiene of the eye. This paper is also a plea for the physician to be on the alert for early glaucoma, so that it may be treated and

vision preserved or bettered, before changes take place which ultimately lead to incurable blindness.

A CASE OF SILENT CALCULOUS PYONEPHROSIS.*

By HERMANN B. GESSNER, A. M., M. D., F. A. C. S.
New Orleans.

(A contribution from the Surgical Department of the Tulane University School of Medicine.)

The object of this paper is to report a case in which, notwithstanding the efforts of medical men armed with the equipment of a good hospital, a diagnosis was arrived at only at autopsy.

M. B. H., aged 61 years, was taken ill on Wednesday, November 22, 1922, complaining of what she called a "terrible" backache; this caused her to be put to bed at once. On the 23rd she complained of "awful" pains in the abdomen; she vomited; passed bloody-looking urine; was given an enema which was quite effective. There was severe pain in the abdomen on the 24th, both sides involved, but especially the left; vomiting occurred again; the urine was still bloody-looking; the bowels moved by enema. Morphine was given twice on this day.

November 25th she was still suffering with abdominal pain; no vomiting; urine less bloody-looking; enema given with good results; morphine given once this day.

November 26th, Sunday, she was brought into New Orleans from Covington, requiring a hypodermic of morphine on the way for epigastric pain.

Examination at Touro Infirmary this day showed the thorax negative except for a few dry râles at the right base. The abdomen was distended, but not rigid; there was tenderness above and on both sides, less below. Vaginal and rectal examinations negative. Urine examination negative. Total leucocyte count 15,500, with 87 per cent neutrophiles. Blood pressure 140-80. Temperature 101° rectal.

The previous history was negative aside from an attack of jaundice with gall-bladder pain some five months previously.

Believing that operative interference was contra-indicated by the absence of abdominal rigidity, by the diffuse character of the pain and by absence of localization, as well as by the exclusion of obstruction through the efficiency of the enemas given, I called Dr. Randolph Lyons in consultation. We had a fluoroscopic and skiagraphic study made of the chest and gastro-intestinal tract, the latter in connection with an opaque enema and a barium meal. The findings showed certain changes in the chest and colon which were of no particular interest and did not advance the solution of our clinical problem.

Three examinations of the urine, with special reference to the presence of blood, were all negative. Blood counts, 9 in all, showed a range of leucocytes from 15,000 to 22,000, with a percentage of neutrophiles ranging from 85 to 89. Rectal temperature ranged at first between 99° and 101°, went to 103.8° on December 3, then ranged between 102° and 103°, finally reaching 104° on December 9. The abdominal pain which was a notable feature of her case throughout was at times colicky, with a desire to go to stool. Sodium sulphate was given twice, with good results. A review of the bowel movements shows a total of 48 movements in 14 days, a little over three a day, including the results of enemas and saline purgatives.

December 7th the patient was seen by Dr. Rudolph Matas, who saw no indication for operation.

December 8th, the seventeenth day of illness, examination of the lungs revealed consolidation of both lungs. On the same day phlebitis in the right leg appeared, with severe pain.

Death took place December 10th, on the 19th day.

Autopsy, held by Dr. J. A. Lanford, revealed an accumulation of pus estimated at 1,000 c.c. lying between the left kidney, the spleen and the omentum, which bounded it on the right. The infection had evidently come from the left kidney, which was firmly embedded in adhesions, its upper portion forming the floor of the abscess cavity. On sectioning, this kidney was found to be the seat of a pyelonephritis, which had largely destroyed the function of the organ. The pelvis presented a large stone (1-4 by 3-4 inches), blocking the

*Read before the Orleans Parish Medical Society, May 6, 1923

ureter, and was distended. The gall-bladder contained several stones varying in size from a pea to a marble. Both lungs presented evidence of pneumonic consolidation.

COMMENT.

Looking back over this case we find certain evidence on which the diagnosis might have been made, though this was not strong or conclusive. One bit of evidence was the pain in the back, described as "terrible backache," which was complained of on the day of onset, but not again during the remaining 18 days. Another was the bloody-looking urine reported by the practitioner in charge of the case as occurring on the first three days following the onset, but not present thereafter in the gross, nor confirmed by the microscopic examinations. No doubt the jamming of the stone into the apex of the pelvic funnel accounts for the complete absence of pus and blood from the urine. Re-examination of the X-ray pctures after the autopsy showed the shadow of the stone very clearly. It may well be that a more careful study of the films, although taken with reference to the gastro intestinal tract, would have shown the shadow to the trained observer and directed attention to the infected kidney.

One naturally thinks of an exploratory operation as a helpful procedure in such a case. Had one been done it would have directed to the epigastrium and to the gall bladder region because of the history of trouble here some five months previous. Nothing had occurred to attract attention to the left upper quadrant where the large pus accumulation lay silent.

THE CHARITY HOSPITAL OF LOUISIANA.

By ALBERT E. FOSSIER, A. M., M. D.

(Continued from last issue.)

The present site of the Charity Hospital was selected in 1832, and the building was completed during the winter of 1833. The cost of construction and the grounds amounted to approximately $150,000.00. This magnificent edifice, which is fast approaching its centenary, stands to-day practically the same as on the first day it opened its to suffering humanity. Some subsequent changes of a minor character shall be referred to later.

Even at this time it stands as a model of Hospital architecture for this climate; its high ceilings, long and wide halls, numerous large outside openings, spacious verandas, give it sufficient ventilation, make it cool in summer and at all times cheerful. These are essentials of construction not usually found in more modern institutions.

In the Historical Epitome of the State of Louisiana, with an Historical Notice of New Orleans. Views and Descriptions of Public Buildings, etc., etc. Published in New Orleans in 1840 is the following: "In the year 1815 the building now occupied by the Legislature and Officers of the State was finished and opened as an hospital for patients, who were received here; the great increase of the population of the city, rendered a large and more commodious edifice necessary; which was accordingly begun A. D. 1831 on the square of ground bounded by Gironde, Gravier, St. Mary and Common streets, and completed so that the patients were removed thither in the winter of 1833-34. Mr. Hemlhill was the architect and builder, and the whole was completed at a cost, including the land, of $149,-750 83. About the same time the old building was sold to the State for the sum of $125,000, payable in bonds, having 50 years to run, at an interest of 5 per cent per annum. The "New Charity Hospital" so-called, is a building of great size, being about 290 feet in its total length, and three stories high. It is composed of a corps of loges opening into a spacious hall, intersected at right angles by another running lengthwise of the building on which the wards open. From this hall access is had by broad stairs to the upper stories which are similarly divided, and thus to the cupola from which there is a magnificent view of the city and environs. The lower story is occupied by the Library, Physicians' Room, Surgeons Room, Medical College, Lecture Room, etc., and the second and third stories into wards for the patients, twenty-one in number, as also into four other apartments de-

*The author is not responsible for phraseology of quotations, as they are taken verbatim from text.

signed as such; but owing to the plan not being carried out, now used one as a chapel and three others for the accommodation of the Sisters of Charity; who with noble benevolence here passed their lives in attenance and kind office to the indigent sick. It is calculated to hold 540 patients."

The second floor was appropriated to the use of female patients and was divided as follows: a ward for women of good character, another for those of bad, and also one for the exclusive use of surgical and obstetrical cases. The grounds around it were enclosed with a substantial brick wall and were handsomely improved and always very neatly kept.

The Sisters of Charity inaugurated their long period of admirable devotion to the sick and afflicted on January 6, 1834. For over 89 years they have given uninterrupted altruistic services to the Charity Hospital. Too much cannot be said in praise of these pious religieuses, who spurning all mundane glory, dedicate their lives to unrelenting toil for the alleviation of suffering, and who have braved pestilences and epidemics and even risked existence itself for the devoted love of humanity. Such sublime sacrifice and renunciation of the comforts and pleasure of this world in the interest of the suffering poor, is only possible with those whose vocation is a religious one, and who have consecrated their existence to the greater glory of their Creator. The services of the Sisters of Charity are indispensable to the Charity Hospital and their value cannot be appraised merely in monetary terms. The respect they command is an incentive to a greater discipline and a stimulus to more energetic work from their subordinates. In actual work, in enforcing economy, in preventing waste, their services have been invaluable, and their scrupulous management of the domestic and nursing department, has been the leading constituent in the success of that institution through nearly a century of uncertain revenues and inadequate appropriations. Succeeding Boards of Administrators have recognized and publicly acknowledged the moral weight and the great economic worth of these ladies in the management of the Hospital.

New Orleans grew by rapid strides; the population in 1830 was 49,826, of which 28,530 were whites and 21,280 were negroes; ten years later, in 1840, it had increased to 102,204. It is recorded that: "It was very nearly made up of Americans, French, Creoles, and Spaniards, together with a large portion of Germans, and a good sprinkling of almost every other nation of the Globe."

The death rate was extremely high, and the census would have shown a still greater increase in population had the city been in better sanitary condition; it was believed that about five hundred immigrants died every year through the so-called acclimatizing process.

The first issue of the New Orleans Medical and Surgical Journal, published in May, 1844, contains the following description of an insane asylum, "a department of the Charity Hospital," which shortly afterwards ceased to operate: "In the rear of the main building is the lunatic asylum, built by an appropriation of the Legislature in 1841. The building is 103 feet long by 35 feet broad, and three stories high. A gallery extends the whole length and height of the house in front, and affords a fine promenade; a passage of 9 feet wide runs through the whole length of the building on each floor. On each side of these passages, the rooms open, 38 in number, well supplied with light and air, and with doors and windows well secured. The stairs run up at the end of the house, and occupy but little space. At the opposite end from the entrance, on the ground floor, is the bathing room, in which is to be found an admirable apparatus for the shower bath, the use of which is so often required in the treatment of mental diseases. The third story of the Asylum is divided into two spacious sleeping apartments. At each end of the building are spacious arbours, which are covered with vines, affording an admirable [illegible] in warm weather. These with the grounds immediately around the Asylum, are well adapted for exercise in the open air." This building occupied by the insane was converted, in 1849, into a department for female patients, and is to-day the colored female building. This change inaugu-

rated the total segregation of the female from the male patients, an arrangement always desirable in a large establishment of this kind.

From the same Journal the following glimpse of the internal management and its relation to its visiting staff is available:

"Previously, in 1843, the Board of Administrators elected annually four Physicians, one Visiting Physician, and a House Surgeon, to perform the professional services of the Hospital for 12 months; who had their duties prescribed and received a small compensation. At the session of the Legislature in January, 1843, the Professors of the Louisiana Medical College petitioned that body to grant them a certain portion of the public square, on which to build a College Edifice; in consideration for which privilege they offered to render all the necessary professional services to the Charity Hospital for the term of ten years, free of charge. As soon as the other physicians of the city became apprized of the movement, they at once sent to the Legslature a counter-petition, numerously signed, protesting against the prayer of the Professors, so far as related to the granting the exclusive attendance of the Hospital, but making no other objection to any other aid the Legislature might think proper to extend to the Medical College; they likewise agreed to attend the Hospital gratis. The result was that the Legislature very properly granted the Professors a site for a College Edifice, and held them bound to attend the wards of the Hospital for the next ten years, provided they should be called upon; but that they should be entitled to no preference in the election of attending Physicians and Surgeons, by the Board of Administrators. The Board can make its selection from the body of the Licensed Physicians in the City; and if their appointments are not accepted, they have a right to demand the services of the aforesaid Professors. They moreover increased the number of Attending Physicians to eight, and Visiting Surgeons to two, and made the election semi-annual.

The Professors are generally elected to attend the wards of the Hospital during the winter season, and are enabled thereby to deliver valuable clinical lectures to the Medical Class.

During the term following the adoption of these regulations, the professional services were most punctually performed; and the mortality of the Hospital will compare favorably with any previous similar period. The Hospital was more frequently visited by the Physicians of the City, and more attention was paid by them to post-mortem examinations, and to special anatomy, than probably was ever done before during the summer season.

Some half-dozen students are admitted into the Hospital who are furnished board and lodging in the house, and are required to perform all the minor operations by the attending Physicians. To be admitted, they are required to give satisfactory evidences of their qualifications, moral character, etc.

Admirable opportunities are afforded these students to prosecute their studies; but a few of them, however, can be induced to remain at their posts during the sickly season; and it is melancholy to relate that of the three who determined to stay last summer, two died of Yellow Fever."

To the rear of the Lunatic Asylum was the dead house—or Morgue. It is described as a small single two-story building, divided into two rooms; one of these contained the corpses before burial, and the other was used as an autopsy and dissecting room. This small simple structure was no doubt ample for the purpose it served; in a contemporary Medical Journal is reflected the appreciation of the anatomists and pathologists of that time: "This latter (the dead house) is well supplied with light, air and water, good tables and benches; it is altogether admirably adapted to the purposes for which it was designed. It is doubted whether any city in the world presents so pleasant and convenient a place for the study of Anatomy, as this Dead House. Well lighted, well ventilated, a hydrant of clear gushing water, and plenty of fresh subjects—what more could be desired."

The group of buildings composing the early Charity Hospital was completed with the addition of two small offices in front of the main building, facing

Common street, now Tulane Avenue. They were used by the clerk and the porter, whose duty it was to attend to the front gate, and give entrance to only certain privileged persons without paying an admittance fee of twenty-five cents. This toll has been only recently abolished, the fare box, a relic of an old mule street car, is still existing at the entrance of the Hospital.

This item of interest is taken from the January number of the New Orleans Medical and Surgical Journal of the year 1847: "We are gratified to learn that the administrators of the institution have determined to erect an amphitheatre for the performance of surgical operations. Such a thing has long been wanted. Heretofore operations were performed in the wards to the great terror of the surrounding sick, with the inconvenience to the operating surgeons, and where it was impossible for a large number of spectators to witness what was being done. A good amphitheatre is indispensably necessary to a large hospital, and we are glad to hear that the one proposed is to be erected as soon as possible.

The annual report of 1847 is of historical importance. We find the following:

MAIN BUILDING.

Admitted	11,690
Discharged	9,369
Died	2,037
Remaining on the first of January, 1848	828

LUNATIC ASYLUM.

Admitted	678
Discharged	541
Died	85
Remaining on the first of January 1848	125

These are the largest figures ever seen on the books of the Charity Hospital. No hospital should be permitted to take in double the number of patients it can entertain comfortably, for it cannot be done in justice to the sick. The wards of the Hospital are literally crammed. A row of beds extend all around the walls and another in the middle of the floor. Many patients have to sit all day and and to lie upon pallets at night. The whole house is infected with Typhoid Fever, thus rendering it dangerous for patients laboring under other diseases to go there. The House students, nurses and Sisters of Charity are suffering from the disease. Diarrhea and Dysentery are also common, and there are seven or eight cases of small pox in the adjoining lunatic asylum. But one thing is lacking to complete the catalogue of miseries—erysipelas will probably break out before long, and then the cup will be full. We deem it our duty to record these melancholy facts to make up the Medical History of the day. When evils become glaring and outrageous they enforce reform, and often not before."

This deplorable condition, due to the greatly overcrowded institution, resulted in much needed improvements, for in the year 1848 and1849 a large and important addition was made to the group of hospital buildings which greatly increased its capacity and for many years provided sufficient accommodation to the indigent poor of that growing city. A new wing was constructed in the rear of the main building practically the same size of and paralleling the one previously used by the insane and then converted into the Women's Department. It was planned to provide suitable accommodation for the Sisters of Charity, and sleeping quarters for the stewards, also to serve as a refectory for the officers and other inmates of the Institution. This building is existing to-day and is serving practically the same purpose as originally intended.

The Hospital at that time could comfortably accommodate one thousand patients, and had a yearly average of between eleven and thirteen thousand admissions. It was then one of the largest, if not the largest, hospital in existence; it stood favorable comparison with those of Europe and America. At that time in Paris, the Hotel Dieu had a capacity of 810 beds and La Charite 494 beds. In that city there were many more charitable institutions, but the two mentioned were the largest.

Again mention is made in the Hospital report of 1845 of the Abuse of the Charity wards of that Institution by persons able to pay for medical services: "A large number of these patients are not proper subjects of charity, and the

State should not be taxed with their medical expenses; yet they have free access to this Hospital."

And also in the annual report of 1846 the same complaint is voiced: "This extraordinary number (8,044) affords sufficient evidence that access to the Hospital is altogether too free and easy —one-half that amount of real objects of charity suffering under sickness could not be found in our city during any year."

The following quotation from the same report is of especial interest to the profession of to-day who resent the unjust imposition of a tax on the practice of Medicine: "In conclusion, we cannot omit this occasion to remark, that whilst the physicians of New Orleans are attending annually in the services of the State, between six and seven thousand invalids, without charge, the Legislature, in its wisdom and liberality, thought proper at its last session to impose a tax upon the Profession."

The following summary from the report of the Board of Administrators shows the then relative low cost of *hospitalization* as compared to the current time:

Income of the Charity Hospital for the year 1849:

Tax on passengers	$53,412.46
Ball licenses	2,524.15
Exhibitions, licenses	294.00
Fines on gambling	2,000.00
Donations	603.92
Gate money	868.70
Pay patients	4,091.80
Deceased patients	588.08
Sale of sundries	861.55
Bills receivable	3,725.02
State appropriation	10,000.00
Profit and loss	270.02
Insurance Ac. dividend	199.90
Slaves Sold	1,925.01
General charges	59.25
Bills payable, accom	8,500.00
Interest account	27.44
Total	$89,951.30

Admissions to the Charity Hospital in 1848 and 1849:

Number of admissions in 1848	11,955
Number of admissions in 1848	11,945
Increase of patients in 1849	3,613

Or 30 23-100 per cent over 1848.

11,945 cost in 1848, $68,048.54, or $5.78 per patient.

15,558 cost in 1849, $66,351.32, or $4.26 per patient.

Reduction per patient $1.52.

The year 1847 was made eventful in the annals of that institution by its historical connection with the Mexican War.. It also chronicles the great epidemic of typhus which raged throughout the city and which originated from a focus of infection arising in the Charity Hospital. We are told of the straggling return of sick and discharged soldiers of the United States Army and that scores of wounded heroes worn out with typhoid and dysentery taxed the utmost capacity of not only the Charity but of every other private and public institution.

The register of the Hospital shows on the 29th of April the admission of sixty-nine Irish immigrants taken from the ship Stephen Baldwin which had just arrived from Liverpool. Three hundred refugees were embarked on that ship; they had heard of the liberty and prosperity of the new country and were determined to risk the uncertain destinies of a long voyage to America to escape the persecution of a despotic country. Twenty-six of these immigrants never viewed the shores of their promised land, for in a watery grave they found everlasting peace and relief from tyrannical despotism. The deplorable condition of those fortunate enough to survive the tortures of that voyage is thus described: "The foreign immigrants are the most miserable set of poor, half-starved wretches, worn out by the combined horrors of a long sea voyage, ship fever and bowel complaints ever seen." That the combined influx of soldiers and immigrants strained the utmost capacity of the Charity Hospital, and taxed the ingenuity of this community (just renowned for its hospitality, generosity and charity) to provide for these unfortunates, is best attested by the following quotation: "As matters are going on, this large institution may be completely monopolized by foreigners; and in case of an epidemic our own poor will be totally excluded from its benefit. It seems to us that they should either at

once be sent up to the great West, or there should be established, beyond the precincts of the City, a Hospital for their special accommodation. They are fellow beings and we cannot see them perish in our streets; though from the present prospect, it is apparent that the benevolence and generosity of our citizens will be heavily taxed before the summer is over." Typhus soon spread to the four corners of the town and became epidemic and in its wake the death of four Charity Hospital attendants, martyrs to their devotion and love of humanity. The congestion became so great it was necessary for the Irish Immigrant Society to establish emergency hospitals in the upper part of the city. Physicians and Apothecaries were appointed by the Municipal Council to visit and to furnish gratuitously medicines to the sick. All religious and benevolent societies rose to the occasion, and nobly responded to the call of distress; they vied with each other in rendering distinguished services. Yet, such noble charity resulted in only scant appreciation. Complaint on that score is thus expressed: "These poor creatures (almost exclusively foreigners), seem to be incapable of appreciating the active benevolence expended in their behalf, and often display a disgusting want of sympathy with each other, yet this does not stay the hand of charity."

The greatest evils are sometimes blessings in disguise, calamities frequently usher in reforms which lead to immunity, catastrophies arouse the indifferent to impending dangers, and pestilences promote research which often result in their eradication. In 1850 another typhus immigrant from the ship "Uriel" arrived and reported the death of many during the passage. The sick were sent to the Hospital and the vessel detained at the point for a few days to be cleansed and disinfected. These precautions prevented a spread of the disease in the city.

"Hospital unusually free from diseases;" observed the New Orleans Medical and Surgical Journal in its July number of the year 1850, "and we announce it as at once both remarkable and indicative of the high state of public health that between ten and twelve of the wards of the Charity Hospital have been recently closed—the number of patients having diminished so rapidly as to vacate a large portion of the building. Such an event at this season of the year should not be allowed to pass unnoticed, and we record the fact with great satisfaction." This records a most unusual phase in the existence of that institution.

A few years previous to the Civil War the annual expenditures varied from $73,000.00 to $78,000.00. The ceaseless tide of immigration, and the great influx to our city of individuals from all those States bordering the Mississippi river and its tributaries, provided through the tax on passengers the bulk of the revenue for the maintenance of the Charity Hospital. In 1854 this tax amounted to upwards of $71,000.00, but decreased to $41,000.00 in 1855; in 1856 to $28,000.00, in 1857 to $30,201.75, in 1858 to $19,640.25, in 1859 $14,130.10, and 1860 to $16,335.35. The great falling off of the revenue derived from this tax left a large deficit in the annual budgets that had to be provided for by State appropriations.

The admissions to the institution during the same period varied between nine and thirteen thousand. A very small number of these were native Louisianians, the greater majority being foreigners.

The following figures taken from the report of the Board of Administrators of the Charity Hospital for the year 1859 are practically the same as those of a few previous years.

Patients admitted from Louisiana	377
Patients admitted from United States	1,634
Patients admitted from Foreign Countries	10,753
Unknown	11
Total	12,775

It is interesting to note that the largest number of foreigners admitted were Irish, 5,888 ofwhom were administered to that institution, which was very nearly half the total number of admissions; the next largest number were Germans and Prussians, their registration amounted to 2,262, then the French with 742 and the English with 591. This

proportion remained fairly constant during the fifteen years previous to the Civil War.

In the year 1848 "Letheon" (ether) introduced by W. T. Morton, was used with his permission in the Hospital. A choice of anesthetics soon become a matter of controversy as to the relative merits of ether and chloroform. This editorial in the June issue of the New Orleans Medical News and Hospital Gazette of the year 1859 gives an aspect of the choice of general anesthetics in the early years of its use in our hospital: "From the London Medical Times and Gazette we learn that 'Dr. Haywood of the United States' " (of Boston, we presume), has written a letter to the Surgical Society, in which he recommends the abandonment of Chloroform, and the substitution of ether. "He states that in all the large hospitals at Naples, Lyons, and in America, ether is alone employed, "etc." We must beg leave to correct an egregious error into which Dr. Haywood has fallen, if he classes the Charity Hospital of New Orleans among those wherein ether is used in preference to chloroform. We are a daily visitor to the Charity Hospital, and we do not recollect having seen ether administered except as a rare experiment. Since 1848 Chloroform has been in daily use in the Institution; it has been and is still given to all sorts of cases, medical, surgical, and obstetrical, and we do not know of more than one or two deaths from its use. Indeed, in all New Orleans, we have heard of but two deaths from the use of the agent and we are not now certain that either of them occurred in the Hospital. A woman (a hospital patient) in the hands of an intimate medical friend,did one day appear to die under the administration of chloroform, but the tongue was quickly and forcibly drawn forward, and she respired again.

The fact is, our Boston brethren have a little local pride about ether which blinds them to the superiority of chloroform. But they have an up-hill business of it if they think of making other people endorse their ideas. We think we can confidently predict that New Orleans will never embrace ether as an anesthetic."

A gruesome episode is related by Doctor Ernest Lewis in his "Reminiscences." This duel between these two prominent house surgeons should be recorded in the historical annals of the Institution in which they so faithfully and efficiently labored: "During the same year (1860) a tragic incident occurred in the Charity Hospital. Dr. John Foster, the House Surgeon, had succeeded Dr. Chopin, who filled that office from 1853 to 1858, succeeding Dr. Foster in turn. They were bitter political enemies and professional rivals. One of the internes by the name of Weams was fatally shot in a brawl at a Carnival ball by a law student and conveyed to the Charity Hospital, where he was seen by both Chopin and Foster, but at different hours. What one prescribed the other threw out of the window. One morning their visits clashed and a fight followed at the bedside of the dying student, which had no consequence as they were separated by mutual friends. A few days later, meeting in front of the hospital entrance and both being armed, they engaged in a gun battle in which Chopin was wounded in the neck and the external jugular vein severed."

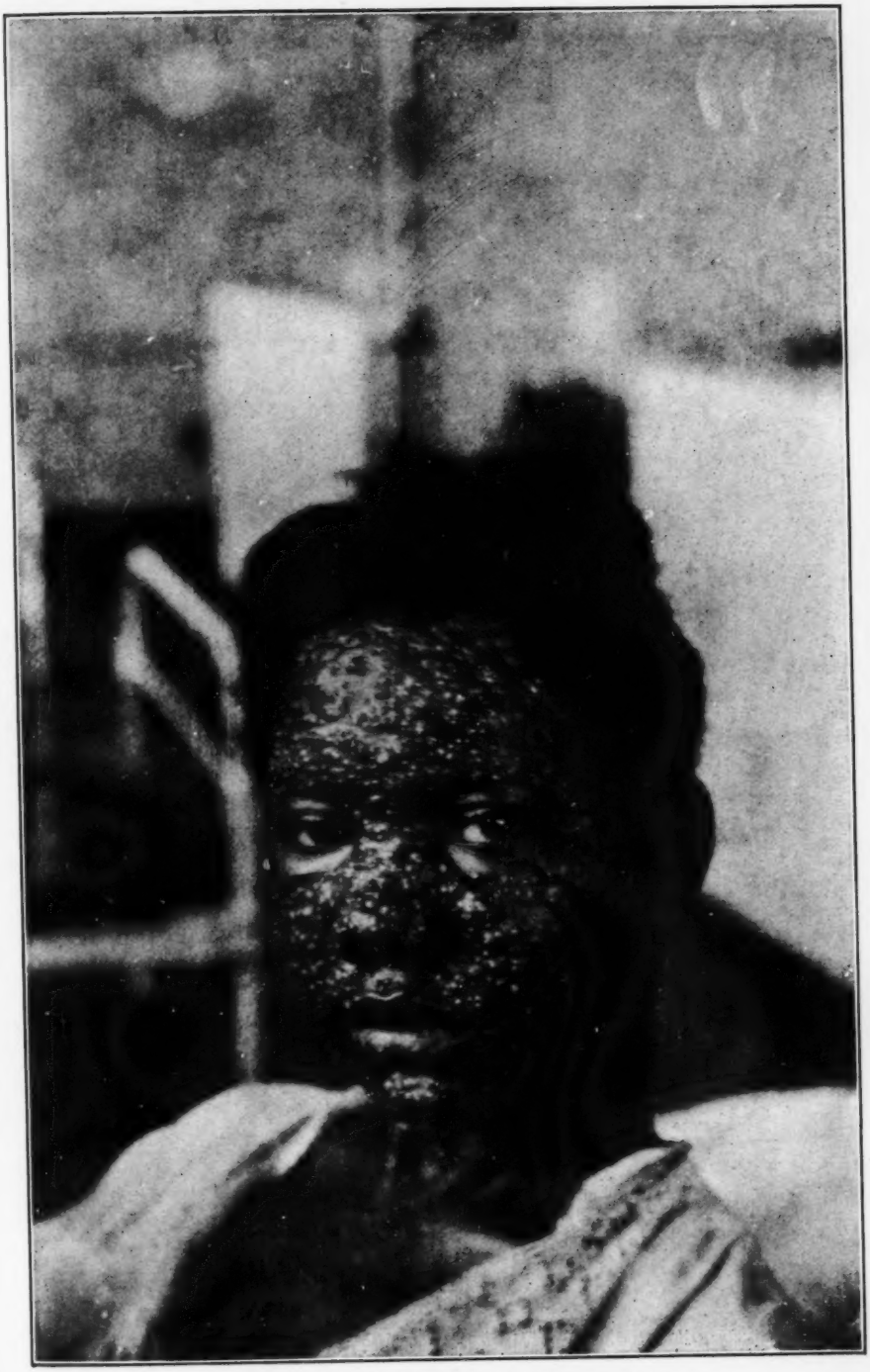
When war between the States was declared, the smouldering fires of suspicion, rebellion and hatred burst into a conflagration that swept the Country, and was a holocaust of the patriotism and heroism of a whole nation. Again the Charity Hospital, the largest in the Confederate States, was called upon to surmount tremendous obstacles. The Board of Administrators recognizing the predicament in which the Institution would be placed made the following recmendation to the Legislature:

"In asking the Legislature for renewal appropriations for the next fourteen months, we would respectfully refer to the fact that this Institution is now, and probably will continue, during the existing year, to be the most convenient if not the only refuge in the southwest for sick and disabled soldiers and mariners. The patients of the old Marine Hospital having been transferred to the Charity Hospital, we have been compelled to set apart several wards for the accomodation of sick soldiers and sailors, and although through the kind assistance of Collector Hatch, a small fund in his hands ($1,023), set

apart for the support of the old Marine Hospital has been paid over to the treasurer, yet, with this exception, no provision has been made by the Confederate Congress, nor has any funds been furnished by the administration for their support. For the ensuing year, the Charity Hospital will be compelled from the exigencies of the case, not only to meet the ordinary demands of the sick and disabled, but to subserve to some extent the purpose of a military and naval hospital, at a time when ample provision of this nature is indispensable." No contemporary reference as to the activities of that Institution could be found during the war. No annual hospital reports were printed, and local medical journals suspended publication during these trying days. The activities of the Hospital, and the role it played in that great drama are handed down to us in the "Reminiscences" of Doctor Ernest Lewis, in which he related his personal experiences as Acting House Surgeon during the war: "Before the annual meeting of the Board, February, 1862, Dr. Sprague, the Assistant House Surgeon, resigned, and at the suggestion of Dr. Nichols, I petitioned the Faculty for a premature examination, to apply for the vacant hospital position, which was granted, and passed. At the meeting of the Board I was elected. A few months later, Dr. Nichols resigning, I was appointed Acting House Surgeon with an increase in salary. The full title was not given me, I was informed by the President, Judge J. N. Lea, because of my youth. I was not then 22. On the surrender of the city to the Federal fleet and the arrival of General Butler to take possession, his Medical Director called at the hospital and requested me to assign a part of the institution for his sick and wounded. I flatly refused, telling him the institution was for the poor of the State only, but the Federals being in power, he could take possession if he chose and the Hospital Staff would withdraw. He replied he would not have us do that and left. He afterwards converted the St. Louis Hotel into a military Hospital. Before the federal occupation of the city the old Marine Hospital, on Tulane Avenue, where now is the House of Detention, was used as a Confederate hospital, with Major C. Beard in charge. Cut off from his sources of supplies, it had to be closed. He wrote me to that effect and of his dilemma regarding his sick and wounded, requesting that they be received at the Charity Hospital. My consent being given, they were transferred here. This coming to the knowledge of General Butler, led to the arrest of the members of the Board and myself. When brought to his presence at the Custom House, looking at me sternly he said, "How comes it, sir, that you, a physician, have discriminated between my sick and those of the Confederacy?" I answered, "they were not received as soldiers, but as Charity patients," and handed him Dr. Beard's letter, which he read and, looking up, said, "I see you have an excuse, but having established a precedent, you will have to receive my men." Making a virtue of necessity and not aspiring to martyrdom by imprisonment at Ft. St. Philip or Ship Island, I answered, "Very well, sir, but furnish me with medical men to attend them, as we are very short-handed." He then authorized me to employ two physicians at a salary of $50.00 a month each, which he would pay them. I appointed my friends, Dr. Robert Davis, the uncle of Dr. Davis of our city, and Dr. Cleary to that duty. Some time later he issued his famous order compelling everyone to take the oath of allegiance or register as enemies of the United States Government. The entire Hospital Staff registered as enemies excepting J. A. Root, an interne, who took the oath of allegiance and becamt Assistant House Surgeon in 1871. When General Banks superseded General Butler, he appointed a Republican Board, and at the annual meeting in February, 1863, Dr. Smythe was elected House Sugeon. I was offered the Assistant House Surgeonship with an increase of salary, but declined."

(To be continued.)

Confluent Smallpox Papulous Eruption.



Confluent Smallpox Papulous Eruption.

Confluent Smallpox Umpilication of the Pustules.

SMALLPOX — HISTORY, DIAGNOSIS, SYMPTOMATOLOGY AND TREATMENT.*

By J. G. STULB, M. D.
New Orleans, La.

HISTORICAL RESUME.

Smallpox dates its origin to remote antiquity. Its first appearance in the world is hidden in the mists of the past, and although such authorities as De Haen, Willan, Moore and Barren assert that it was known in ancient Greece and Rome, Adams and other writers of note deny this and advance other theories. Even as early as the tenth century, the celebrated Rhazes, the Arabian, wrote exhaustively on the subject. Galen was evidently familiar with the pest, as will be evidenced by reference to his first, fourth, ninth and fourteenth books. The Chinese are reputed to have known the disease 2,000 years before the Chrisian era.

Whether small pox was known in ancient times or not, is immaterial at this date, but the fact remains that it is one of the most noxious scourges that afflict mankind and sanitary measures to prevent its prevalence and spread cannot be too severe.

DEFINITION.

Smallpox is one of the most infectious diseases known. It is an acute, contagious, febrile, exanthematous malady, characterized by several stages of eruption—macular, panular, vesicular and pustular.

Smallpox respects neither sex, age nor race. It may infect the fetus in the womb of the mother and attacks the nonagenarian as well. The symptoms are chill, fever, headache, lumbar pains and, sometimes, vomiting. It is transmissible not only by direct contact with the patient or by fomites infected by those afflicted with the malady; but sometimes infection takes place through the air at considerable distances. The life of the germ is great and dried pus from smallpox patients has been found virulent years after.

ETIOLOGY.

The cause of smallpox has not yet been discovered.

*Read Before the Louisiana State Medical Society Meeting April 24-26, 1923.

INCUBATION.

The time of incubation is from ten to fourteen days and the danger to others commences with the initial period and lasts through the disease, as long as there are scabs on the patient. Some writers observed the incubation period to be as long as eighteen or twenty days.

SYMPTOMS AND COURSE OF THE DISEASE.

Smallpox usually commences with a chill and the temperature is characteristic. From the onset erythematous exanthema is frequent. It is irregularly scattered over the body or appears between the umbilicus, symphysis and Poupart's ligament and on the inside of the thigh; however, the lesions are macular and are sharply marked and a shotty feeling manifests itself.

It has been my experience to observe that the exanthema at times closely resembles that of measles in fact so closely that it cannot be differentiated at times from a severe form of measles. The catarrhal symptoms of the eyes and nose, however, are absent. A very severe type of smallpox, generally confluent or hemorrhagic, with pemphigus, follows. Such cases call for special consideration of the prodromal symptoms to make an early and positive diagnosis.

Smallpox eruptions appear on the third day, first on the face, then on the trunk, arms and legs, and the temperature drops, but not to the normal, to rise again with the stage of suppuration (the formation of pustules). During the second week the fever drops irregularly to the normal. In cases where the eruption is tardy, a cup of hot tea every two hours will bring it out in from twelve to forty-eight hours.

The skin offers less favorable conditions of growth to the virus than the mucous membrane, which is ordinarily affected, and therefore gives the body an opportunity to better protect itself by the production of antibodies.

The principal varieties of smallpox are:

(1) Variola, discrete.
(2) Variola, confluent.

Complications: Edema of the glottis; bronchitis; broncho-pneumonia; myocarditis; convulsions in children. In

adults the delirium may persist and become violent, and finally subside into a fatal coma. Boils are very frequent and may be severe. Pemphigus (bullae) and cellulitis.

A catarrhal and purulent conjunctivitis is also present. The secretions cause adhesion of the eyelids and unless great care is taken this complication may develop into ulceration and perforation.)

(3) Variola, Hemorrhagic, petechial or black smallpox.

The illness starts with the usual symptoms, but with more intense constitutional disturbance. On the evening of the second or on the third day, there is a diffuse hyperemic rash, with small hemorrhages, and the spots increase in size. Pemphigus (bullae) appears at times. Death may take place before the rash appears.

DIAGNOSIS.

It is not an easy matter to differentiate smallpox from some of the maladies which simulate it. A differentiation of smallpox from chickenpox is sometimes difficult, especially after the development of pustules and vesicules. Chickenpox lesions appear on successive days and are seen in different stages of development: macules, vesicles, pustules and scabs may be observed side by side and light pressure will rupture the vesicles and pustules. If the diagnosis is doubtful, from the character of the eruption, the temperature curve, the initial exanthema, the prodrome and the length of time of development of the eruption will materially help in arriving at a correct diagnosis.

Some writers claim that varicella (chickenpox) is rare in the adult. I have not found it so, but have seen during the past year over one hundred cases in adult men and women.

Close observation will generally differentiate between smallpox and chickenpox, but as I have above stated, it is sometimes very difficult to differentiate. Smallpox is generally ushered with a chill; varicella is not. Varicella is very seldom characterized by initial fever; when present it is very slight and generally disappears within twenty-four hours. In smallpox, however, the fever reaches 102 degrees F. and persists for about forty-eight hours. The eruption is also slightly different and a close study of the skin lesions will generally clear up any doubt which may exist.

The diagnosis of smallpox from syphilis, pemphigus, impetigo contagioso and measles is an easy matter and need not be touched upon in this paper.

PROPHYLAXIS.

Vaccination and re-vaccination is the surest way to prevent smallpox and should be compulsory in every State. In Louisiana vaccination is not compulsory. In New Orleans, compulsory vaccination of children before entering the public schools and re-vaccination every seven years, is the law, due to combined action of the City Board of Health and the School Board.

Immunization was introduced into Europe by Timoni (1713). Pilarini (1716) and Lady Mary Wortley Montague (1721), wife of the English Ambassador at Constantinople, who brought it in vogue in England that year. Variolation was then more practiced than vaccination. Thousands of persons were inoculated, even troops in the Continental Army; but vaccination was soon recognized as a safer procedure than variolation, since the inoculated subjects, in the latter case, became smallpox carriers, through the sores. But it was not until the publication of Jenner's epochal work (1798) that the human virus for vaccination was accorded the lead.

Lady Montague's method consisted of rubbing into the skin of the healthy the dried substance of vesicles of light cases of smallpox. This usually produced a light attack of the disease and protection for life. The skin offers less favorable conditions of growth to the virus than the mucous membrane, thereby giving the body an opportunity to protect itself better by the production of antibodies.

At the time Lady Montague introduced variolation into England, it was common knowledge among the people of the country of Gloucester that passing through an attack of cowpox would protect against smallpox.

Jenner, who thoroughly examined this fact, published his results in 1798, showing further that the vaccine could be used from man to man with the same results. A little later it was experimentally shown that calves vaccinated with the contagion of smallpox would develop cowpox and this re-vaccinated into man produced only local vaccine pustules, but protected against smallpox infection. The passage of the virus through the calf diminishes the virulence of the contagion; several passages through the calf are necessary before it is sufficiently weakened to be safely used on man. It was later observed that the protection produced by this vaccination practically lessened and that re-vaccination every ten years was necessary to protect permanently. This method is now commonly used in States where vaccination is not compulsory.

Vaccination is ineffective after the first symptoms of smallpox have made their appearance.

Isolation is an absolute necessity in suspected cases. No one but physicians and nurses, under careful precautions, should see the patient during the course of the disease. The patient should be confined in an established isolation hospital. If it should become necessary for any one, except physicians and nurses, to visit the patient, he must be vaccinated, as well as those persons who have been in contact with him, pending the clearing up of the diagnosis. Isolation has to be made at once, as danger of infection commences with the first symptoms and should be continued as long as any scabs can be found. The soles of the feet have to be especially examined; here, where scabs adhere to the hard epidermis longer than anywhere else, frequent bathing of the feet in hot, soapy water will cause their removal. Rigorous cleaning of face, hands and head after seeing a patient is necessary to prevent carrying the contagion to others; and everything that comes in contact with the sick has to be thoroughly disinfected, which is best done with overheated steam. To prevent the drying scabs and their debris from dropping off the body and spreading through the air, I direct the patient to be anointed with iodized-phenol, 5 per cent in cotton seed oil; the warm *bath* is given every morning and scabs gently removed by washing and the patient is dried and again anointed. I have used in my private practice, as a disinfectant mouth wash, potassium chloride, tr. ferri chloride, of each three drams, glycerine two ounces, aquae qs. to make a six ounce mixture. One teaspoonful in a half cup of hot water is used as a gargle three times a day, after each meal, with the greatest advantage. The nascent chlorine has a decided bactericidal effect. Nothing should be taken by mouth for at least an hour after the wash has been used.

TREATMENT.

A specific treatment is not known. The treatment of smallpox has to be symptomotic, simple in light cases, but requiring judgment and painstaking care in the severer form, especially in patients with damaged organs. Every patient, after an examination has been made, should be given a large dose of castor oil, calomel and soda, each grains five, preferably followed in six hours by a saline laxative in hot water. I consider this last measure of great importance on account of the cleansing of the bowels, as well as the effect it has on the circulation. Dr. Otto Lerch states that dilated hearts contract and that a flabby, irregular pulse becomes more regular and firmer after such a purgative. I can confirm this observation. There is not an infectious disease where the muscles of the heart are not affected.

Smallpox is dangerous even in the light form. Most of the symptoms are symptoms of intoxication and the cleaning of the bowels and keeping them clean will lessen this danger.

The mouth cavity has to be carefully examined and cleaned after every meal and cleaned with a solution of chlorate of potash, or boric acid, followed by a decoction of slimy substances.

To dilute the blood and protect the kidneys large draughts of water are necessary. This is best given at stated intervals. I direct that a tumbler full be given every two hours, to which half a teaspoonful of spirits of nitre should be added; this will impress the patient

and the nurse, and in this way prompt attention will be secured.

The diet is generally that of a fever patient.

During the febrile process large amounts of liquids are indicated to dilute the blood and make it less toxic and irritating, and for the same reason condiments—pepper and salt—must be used sparingly. The food is given in liquid form, the medicine diluted with water and fruit juice added to allay thirst. If the patient objects to large quantities of liquid, it must be given in an enema, or by hypodermoclysis as physiologic salt solution; when the kidneys are affected the salt must be replaced with sugar of milk. Milk may be given as soup with an addition of lime water. Buttermilk is well borne. Beef tea enriched with cereals and eggs, orange juice beaten with sugar, the various meat wines, and milk jellies, are all useful.

After the patient has passed the febrile state, then the diet may tend, gradually, to a semi-solid, and finally to a convalescent diet. In my hospital practice I prescribe throughout the febrile state, an oatmeal soup—that is, oatmeal thoroughly boiled with milk to a creamy consistency—a bowlful three times a day, followed, after umbilication of the pustules, with a thoroughly boiled vegetable soup, and this gradually by a convalescent diet. This regime is well-borne and liked by the patient.

The temperature is a negligible factor. Only in cases of hyperpyrexia, it should be lowered with some of the well-known anti-pyretics. In cases of great excitation, a prolonged warm bath, or luminal-soda, veronal, or chloral hydrate, may be given.

If the treatment, as outlined above, is closely followed, antipyretics and narcotics will never be required.

The treatment of the eruption is best carried out with hot compresses, which relieve tension and pain. Permanganate of potash may be added to the water as a deodorant. I apply as routine treatment an ointment consisting of ichtosan or ichythyol 25 per cent, in vaseline and lanoline, equal parts. This gives relief and prevents pitting; occasionally, instead, 5 per cent phenol, in bismuth and vaseline and lanoline, equal parts, if cheapness has to be considered. Finsen recommends the treatment with red light to prevent the formation of pus and pitting. I have had no experience with this method. The intense itching felt by the patient during the time of dessication is relieved by prolonged warm baths and the soapy bath, to accelerate the removal of dried scabs.

MORTALITY.

One of the worst heritages that the discoverers of America brought to the New World, was smallpox. It was unknown to the American Indian prior to the landing of Columbus on the Western Continent. It appeared in England in the first part of the thirteeth Century and two hundred years later invaded Germany. The first outbreak in America occurred in Mexico in 1527. First occurrences in other countries are not authentic.

The Mexican epidemic was the worst ever recorded in history. Prescott's "Conquest of Mexico" gives gruesome details of this scourge, and says that it went "sweeping over the land like fire over the prairies." Nearly four million natives died within a few years. The aborigines seemed to be specially susceptible to the malady, whole tribes being annihilated and wide sections depopulated. Entire communities were decimated in Brazil in 1633, while Ecuador lost 100,000 within a few years after the invasion of the disease.

Even far-off Greenland has been visited, losing about one-third of her population in the eighteenth century.

Historical accounts of the ravages of smallpox could fill several volumes, and the above resume is given to show the great mortality of this lothsome disease, if allowed to go unchecked.

My personal experience in the management of smallpox has led me to believe that it is not such a deadly disease if properly attended to and rigid prophylactic measures followed. During the period I was in charge of the smallpox cases at the New Orleans Isolation Hospital (January, 1917, to December, 1919), the cases and deaths were as follows:

Confluent Smallpox.

SMALLPOX CASES AND DETAHS IN THE ISOLATION HOSPITAL, NEW ORLEANS.

	1917		1918		1919	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
January	24	0	28	0	4	0
February	30	0	65	0	11	0
March	47	0	49	0	21	0
April	22	0	23	0	18	0
May	16	0	16	0	22	1
June	4	0	17	0	14	1
July	14	0	0	0	3	1
August	0	0	1	0	0	0
September	2	0	1	0	1	0
October	3	0	1	0	0	0
November	2	0	1	0	3	0
December	9	0	5	0	3	0
Totals	173	0	207	0	104	7

Total number of cases under my care during the three years I was in charge at the Isolation Hospital, 520; deaths, 3. It will be noticed that there were no deaths in 1917 and 1918, and that the three deaths in 1919 occurred successively in May, June and July. These fatal cases were almost moribund when brought to the Isolation Hospital, and there remained little to do but ease the sufferings of the stricken ones.

INFECTION.

The virus invades the human body through the mucosa of the respiratory track. The time of incubation is from ten to fifteen days and the danger to others commences with the vesicle stage and lasts throughout the disease and as long as there are scabs on the patient.

I doubt natural immunity from the disease. It is my opinion that one attack of the disease protects for life.

It is also my opinion that vaccination is ineffective after the vesicles have made their appearance. The virus is in the blood stream and propagation takes place until expiration of the period of incubation.

A case of interest that came to my knowledge was the admission into the Isolation Hospital of two women, both in a pregnant state. Both were suffering with confluent cases of smallpox. They were discharged as cured after approximately forty days' treatment, and free from all infection. About two weeks after discharge they gave birth to children, with no signs of smallpox, nor any eruption, as far as the children were concerned. This demonstrates that when the mothers of these children became infected they carried this infection, simultaneously, to their fetuses; and further that the discharge of the mother free from all infection of the disease, applies to the foetus as well.

During my connection with the Isolation Hospital of this city, I was summoned to a home in the lower portion of our city where it was reported smallpox was prevalent. In this house I found three cases of smallpox; one of the cases was a child of eighteen months, another an infant of about six days, and the third the mother of both of these children. These patients were removed at once to the Isolation Hospital.

Investigation of the case developed that the eighteen-months-old child had been sick for twenty-one days preceding my visit and that the eruption appeared on both the mother and younger child three days after its birth. This demonstrates that the mother and younger child were infected shortly after the appearance of the eruption on the first child, taking into consideration the usual period of incubation. This is further demonstrative of the fact that the mother and her fetus were infected at the vesicle stage.

Another summons brought me to a residence on Soniat street, where two cases of smallpox were found; i. e., mother and infant. Both patients were removed to the Isolation Hospital.

Investigation of this case developed that the mother, while in a pregnant stage, visited her husband daily at the Isolation Hospital; the husband having been brought to this institution suffering with bubonic plague. Nine days after the birth of the child eruption appeared on both the mother and child, which is demonstrative of the fact that

the mother and child were infected about six days preceding the birth.

I had occasion to vaccinate a one-year-old child in this same house on the same day that the other two patients were removed to the Isolation Hospital. Ten days after vaccination this child developed smallpox the period of incubation showing that it had been infected prior to vaccination.

DISCUSSION.

Dr. Ralph Hopkins (New Orleans): By no means of least importance in the problem of smallpox is the question of diagnosis, and the differentiation between atypical cases of variola and atypical cases of varicella. One point that is most helpful in leading to correct diagnosis is the characterictics of the individual lesions in these two diseases. The importance of this point was very strongly impressed upon me in the recent outbreak of smallpox in Marine Hospital 66, the national leprosarium. In this isolated community there was no question of differentation between smallpox and chickenpox—it was smallpox, some hemorrhagic, some confluent, some serious, and some very mild. But I do believe that some of the very mild cases, had they occurred in another community, would have been called chickenpox. In many of these the constitutional symptoms were far less than would have been found in even moderately severe chickenpox, and the number of lesions and the usual distribution of smallpox were lacking. The one characteristic, however, in which almost all the cases ran true to smallpox form was the individual vesicles. They were almost always of the type of smallpox vesicles, not the superficial lesions of chickenpox. They were conical in form and hard, some being even harder than the papules of which they were a development. Some of them could not be ruptured by a single puncture, but required numerous punctures to empty them of the fluid. In using this method of differentation between smallpox and chickenpox it should be borne in mind that chickenpox lesions, as they occur on hands and feet and face, on account of the greater thickness of the integument in those regions, are most likely to be taken for the hard vesicles of smallpox.

The lesson to be learned from our experience in Hospital 66 is the necessity for vaccination, even if the community is isolated, as the leper institution is.

Dr. Oscar Dowling (New Orleans): The inclination on the part of many physicians when called upon to diagnose smallpox or chickenpox seems to be to give the patient the benefit of the doubt. In many instances this apparently is the cause of the spread of the disease. In some communities smallpox has been called chickenpox until in another community someone from the former place died from smallpox; then definite information would be furnished the State Board of Health that smallpox existed in both places. We have frequent requests from doctors to send an expert to determine whether or not a case is smallpox. While I can understand the desire to place the responsibility on the State Board of Health, I feel it is a reflection on the local health officer, and if he cannot determine whether the case is smallpox or chickenpox he is at liberty to call in two other men in the parish. Surely three doctors in any parish can diagnose smallpox as opposed to chickenpox. If smallpox could be confined to those who wanted the privilege of having it, it would be a good plan to permit them to suffer the consequences, but unfortunately this is not the case and the burden of controlling the disease rests upon the local and State health officers.

Dr. J. G. Stulb (closing): I will answer Dr. Bel first. After successful vaccination you are protected, according to the authorities, for seven years; but that does not necessarily mean that you cannot contract smallpox. It is possible that following the first vaccination you may contract smallpox, but you will have a mild type. But from you could be conveyed the confluent type or the hemorrhagic. Vaccination is nothing else than rubbing a live virus into the body. I was vaccinated when a boy, but I developed a mild type of smallpox twenty years ago, and from me developed some of the most virulent types that were ever seen by man.

CARBON TETRACHLORIDE IN THE TREATMENT OF HOOKWORM DISEASE WITH REPORT OF CASES.*

By SAM HOBSON, M. D.

From the Department of Medicine, Tulane University and the Medical Department of the Charity Hospital, New Orleans.

Ankylostomiasis or hookworm disease as a clinical entity has been recognized for three centuries. However, it was not until the work of Dubini in 1838 that the etiological factor of the condition was established. Dubini first described the causative parasite, and due to the peculiar bent or curved appearance of its mouth gave it the name of "hookworm." There quickly followed the investigations of Billhartz and Griesenger, Wucherer and the monumental contribution of Looss, who first described the cardinal fact of the penetration of the skin by the larvae and the route by which these latter reach the intestines. At the present time the life cycle of the parasites, its modes of entrance into the animal economy and its baneful influences when infesting its host, are all well known.

Infection by means of the two chief forms of hookworm, Ankylostoma

*Read Before the Louisiana State Medical Society Meeting April 24-26, 1923.

duodenale and Necator Americanus is widespread. There is scarcely a tropical or subtropical country in which heavy infestation of the native population is not present. Recent figures show that in India 60 per cent, in Porto Rico 90 per cent, in the Philippines 12 per cent, in the southern United States 15 per cent, in the mining centers of Germany and France 6 per cent of the native populations suffer from hookworm infection in a graver or milder form. Statistics obtained from the examination of recruits called to the colors under the selective service act during the late war revealed hookworm infection in sections of the United States where, up to then, little evidence of the prevalence of the disease had been noted. The economic loss of the various countries where native population shows endemic hookworm infection is appalling. This economic loss is referable to factors so well known as to require no discussion here.

With the establishment at once of the etiology of hookworm disease and the facts that there are no secondary hosts, that the infection is not readily spread by the ingestion of milk or water, that flies or insects do not carry it, it would appear that control should be very simple. Such, however, is not the case; even the prevention of the disease is extremely difficult. The principal angle of attack on ankylostomiasis has been, and very naturally so, attempts to exterminate mature worms in the intestines of human beings in order to check the supply of eggs at its very source. For this purpose various drugs have been employed. Thus, eucalyptus and chloroform, betanaphthol, oleoresin of aspidium, oil of chenopodium and finally and more generally thymol have been used; this latter drug has of late years been the agent of choice unless the patient showed some idiosyncrasy to its use. In 1921 Hall, Zoologist of the United States Bureau of Animal Industry conceived the idea that carbon tetrachloride, a drug practically abandoned as a therapeutic agent fifty years previously, could be successfully used in the treatment of hookworm disease. He carried out experiments with gratifying results upon dogs and monkeys and having administered to himself 3cc of the drug by mouth, reported that it could be given with impunity in such doses to human adults, urged its use in the treatment in human ankylostomiasis and finally warned against possible impurities which could be found in the drug as purchased upon the open market. Stimulated by these investigations there presently appeared a number of favorable reports upon the human administration of the drug. Thus Nicholls, Director of the Bacteriological and Pasteur Institutes of Ceylon, and Hampton, Director of the International Health Board, reported the use of the drug in from 4-10cc doses. They added to the subject a detailed report of the negative histological findings in the various organs of a condemned criminal who had consented to take the drug experimentally in two doses of 6cc each at 13-day intervals. S. M. Lambert reported his observations in 20,000 cases and later in 50,000 treated cases.

The consensus of opinions of these investigations was that carbon tetrachloride is a vermifuge and vermicide of great potency; that it can be administered with safety to humans; that it gives little discomfort to the patient; that it permits treating at low cost vast populations suffering with hookworm.

That Hall's original warning as to the possible ill effects of impure drugs was not sounded in vain is proven by S M. Lambert's experience. After treating 42,000 cases with no fatality, he was unfortunate enough to lose three cases in his next series of 8,000. This he ascribes to a chemically proven impure carbon tetrachloride which he had used in the treatment of this last series. Histological examination of the various organs from one of these fatal cases revealed extensive focal necrosis in the liver, changes identical with those described by Pessoa and Meyer following experimental intoxication with the drug.

The plan of treatment for ankylostomiasis by means of carbon tetrachloride recommended by most investigators is as follows: light supper; no breakfast the following morning; 7:00 a. m. carbon tetrachloride (C. P.) given in the dosage of 2 to 3 minims per year of age, the maximum dose being 45 to

60 minims (3 to 4cc.). The drug may be given in freshly filled hard gelatin capsules, or floated in a tablespoon of water; 9:00 a. m. a purge of magnesium sulphate should be administered; 12:00 noon, a light meal may be taken. The treatment should not be repeated in a lesser interval than three weeks. No more than two treatments need be given. Alcohol addicts should not be given the treatment

With the widespread prevalence of hookworm infection in patients admitted to the Charity Hospital, New Orleans, and in view of the favorable reports of the carbon tetrachloride treatment, it appeared profitable to attempt the treatment of this condition with carbon tetrachloride. Accordingly a number of cases were so treated As some of these cases illustrate various aspects of the use of the drug, and the various modifications in my plan of treatment, it is desired to briefly tabulate them.

Case I—C. H. D.—1797, white male, age 22. Admitted with the complaint of "swimming in head" and epilepsy. Physical examination negative. Routine examination of feces showed many uncinaria ova. Thymol administered in usual manner; one week later stool still showed uncinaria in numbers. Thymol repeated for four more doses, making a total of five treatments, after which uncinaria ova were still fund in stool. Twelve days after the last treatment by thymol, carbon tetrachloride, 5cc. floated in ice water and followed in three hours by magnesium sulphate, was administered. During next 48 hours patient passed 40 hookworms. Three examinations of stool at weekly intervals have failed to show any ova. Here the carbon tetrachloride administered as one dose of the amount recommended as a maximum cleared a case of hookworm disease that had failed to respond to five thymol treatments, illustrating the efficacy of this newer method of attack.

Case II—C. H. D.—5915, white male, age 36. Complaint "diarrhea." Physical examination revealed nothing of importance. Feces examination positive for hookworm ova. Carbon tetrachloride 5cc. administered about two hours after a full meal; patient vomited immediately. A second attempt at administering carbon tetrachloride two hours after a meal again resulted in immediate vomiting. The next day the dose was repeated, but on a fasting stomach, followed in three hours by magnesium sulphate. Medication retained; patient complained of no unpleasant symptoms. One week and four weeks later stool examinations were negative for uncinaria ova. In this case two attempts were made to give the drug shortly after the ingestion of food as recommended by some authorities. In neither attempt was the medication retained. Since, the plan followed has been to administer the drug on a fasting stomach.

Case III—C. H. D.—5709, white male, age 44. Complaint—"weakness". Physical examination: patient very anemic; heart enlarged, downward and to the left; systolic murmur heard best at the apex and transmitted to the left axilla. Total red cells 795,000; hemoglobin 25 per cent; eosinophiles 12 per cent; many uncinaria ova present in stool. Carbon tetrachloride administered 5cc. on a fasting stomach followed in three hours by magnesium sulphate; patient passed 125 hookworms. One week later total red cells 1,250,000 Few uncinaria ova present in feces. Carbon tetrachloride 6.5cc. given. One hour later patient complained of a numbness in the extremities, "queer" feeling in head, nervous and felt like he was going to die. No nausea or vomiting. These symptoms disappeared in a few hours. During the next 24 hours 30 hookworms were counted in the stools. In about three weeks he had gained weight and was greatly improved. Total red cells 4,125,000. Feces negative for ova after three examinations. A larger dose than usually recommended, 6.5cc., was used. Outside of numbness in extremities and "queer feeling in head" which persisted for a short time, no untoward effects were noted.

Case IV—C. H. D—9506, white male, age 18. Complaint—"heart trouble." Physical examination revealed nothing of importance except patient appeared very nervous. Feces positive for uncinaria ova. Carbon tetrachloride 6 cc. administered followed in two and one-half hours by magnesium sulphate. Patient complained of a "funny" feeling in

head; bowels moved twice before the magnesium sulphate was given. Patient passed many hookworms during the next 24 hours. Ten days later a few ova were found in stool. Carbon tetrachloride, 6cc., administered. No symptoms. Seventy-five hookworms were passed. Discharged three weeks later after several negative stool examinations. Here two doses of 6 cc. each were required to rid the patient of his infection. It would therefore appear that it is not always that one treatment will effect a complete cure.

Case V—C. H. 8141, white male, age 23. Complaint—"run down" since having swamp fever. Physical examination negative. Feces positive for uncinaria ova. Carbon tetrachloride, 6cc., administered. No symptoms. Hookworms passed were not counted, but many were seen in stools. Repeated feces examinations before discharge were negative. Here is illustrated a case in which one moderately large dose of 6cc. of carbon tetrachloride cleared a hookworm infection with no untoward results.

SUMMARY.

Carbon tetrachloride is a vermicide that has proven of value in the treatment of ankylostomiasis.

The administration of the drug in amounts of 3-6cc. usually effects a cure after one or two doses.

Care should be taken to secure a chemically pure product.

The drug is pleasant to take, and in ordinary doses of a pure product induces no ill effects in contradistinction to the other drugs recommended.

Administration of carbon tetrachloride should be an an empty stomach, followed in two or three hours by magnesium sulphate.

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DISCUSSION.

Dr. C. C. Bass (New Orleans): I wish to express appreciation of the fact that Dr. Hobson has so ably presented this timely subject before this Society.

The evidence that has been accumulating during the last year or two since carbon tetrachloride was introduced as a remedy for hookworm infection seems to indicate that we have in it as much of a specific as any other previously known remedy. Perhaps it is more specific and more effective than a good many of these that we formerly used; at the same time having the special advantage of being comparatively inexpensive.

One question that arises and should be given serious consideration is the harmfulness or harmlessness of the drug. Choice of remedies should be governed to a large extent by their safety as well as their effectiveness. All of the previously employed remedies which are effective for hookworms have fatalities charged against them. Carbon tetrachloride also now has fatalities charged against it, and in all probalility as it is used more there will be more. We must appreciate the fact, then, that we are not dealing with a perfectly harmless remedy, but that we must employ it with care, and that, until further information has been accumulated, caution should be used in the direction of small doses. All of the remedies that we have for hookworm infection, including this one, are poisonous and are capable of destroying life if given in sufficiently large doses. This brings up the question of the size of dose we can give with safety. We do not understand at the present time why it is that one individual is badly poisoned, perhaps with a comparatively small dose of any of these drugs, while in another individual the same dose has no such effect. There is no method, so far as we know at the present time, by which we can select in advance the individual who possesses this special susceptibility to the effect of any one of these drugs. Dr. Hobson noted symptoms of poisoning from carbon tetrachloride in two cases out of six which should, I believe, be a warning as to the possible danger from this apparently very effective remedy.

Dr. J. T. Halsey (New Orleans): I want to call attention to three points, the observance of which should make the administration of this apparently valuable remedy almost entirely safe. In addition to the deaths reported by Lambert, there have been several fatal cases reported by others, but in many of the cases, in which more or less severe poisoning occurred, there was a history of chronic or recent alcoholism. Therefore the first thing that we should remember is not to give carbon tetrachloride to hard drinkers or to anyone who has recently been on a spree.

The second point is, to use the drug so as to get the minimum of harmful effects with at least satisfactory efficiency. Very few of the cases of poisoning have occurred when the dosage was not greater than one teaspoonful for an average sized adult. I believe that for the present we should never give more than 4 cubic centimeters or one dram to a patient weighing about 150 pounds, and correspondingly larger or smaller doses to individuals weighing more or less.

The last point, which I believe to be equally important, is to take measures which will lessen the possibility of poisonous amounts of the drug being absorbed. Hookworms are almost all in the very upper portion of the small intestine. If the patient swallows a drug on an empty stomach, in a very few minutes that drug has passed into the small intestine, and in a few more minutes it has done all the harm to the worms that it is going to do, and if allowed to remain in the gut any longer it may be absorbed and poison the patient, for if absorbed in sufficient amounts it is unmistakably a poison. Consequently, not three hours, but at the latest two hours, or better still one hour after taking the carbon tetrachloride the patient should take magnesium sulphate or other briskly acting purge. In this way I believe the vermicidal action will not be lessened, while there will be much less chance that enough of the drug will be absorbed to produce any serious symptoms of poisoning.

Dr. Oscar Dowling (New Orleans): I want to appeal to the doctors over the country as well as those in some of the smaller towns, for their influence in bringing about better sanitary conditions in the home, with the hope of eliminating hookworm disease. In my judgment if the doctors of the State of Louisiana would make it a routine practice to examine their patients for hookworm, they would find more of them suffering from the disease than they realize are affected by it.

It is difficult to get statistics. If every case of hookworm disease were reported we could possibly find some way of making arrangements for the treatment of those affected. I appeal to you as the health officer of Louisiana for greater effort on your part toward this end—that of eliminating the hookworm.

ONE HUNDRED PER CENT RESULTS IN THE TREATMENT OF TYPHOID.*

By S. J. COUVILLON. M. D.,
Moreauville, La.

In presenting the successful results in the treatment of a varied number of typhoid cases covering a period of eighteen years of rural country practice, it is not my purpose to institute anything new or perplexing to the profession in the treatment of this dreadful malady, save, perhaps, to cite the astonishing fact that I'm yet to report my first death resulting from the disease.

The lines of treatment which I have followed are not anything the ordinary practitioner, nor the specialist ever attempted, and while the mortality rate according to statistics varies from 8 to 10 per cent, I'm really proud to enjoy a distinction that, out of 134 cases of genuine typhoid fever, the recoveries have been 100 per cent.

*Read Before the Louisiana State Medical Society Meeting April 24-26, 1923.

I very often wonder if those fortunate results are due to the treatment itself, or do they result from a natural change in the cyclical evolution of the disease? Is not typhoid fever less fatal than it was 25 and 30 years ago? Has it become less virulent in nature? These hypotheses are odmissible, for the history of medicine tells us that epidemic diseases appear to undergo not only changes in different years and seasons, but they also appear to undergo more lasting changes. I'm quite willing to admit this hypothesis and I have the kindest respect for certain traditions which have been handed down to us by our forebears, but I cannot forget that in a number of circumstances, and notably in the treatment of typhoid fever, the greatest progress has been realized.

As you will agree with me, to arrive at a positive diagnosis of this disease in the rural districts, is most difficult, owing to the inaccessibilty of good laboratories, and while I never altogether resorted to this RELIABLE method in determining positive diagnosis, yet I never meditated when in doubt. Recognizing the disease as a bacteriemia and especially in suspected cases, my diagnoses were always arrived at through blood culture findings, the medium to reach the bacillus typhosus. At times when I have been confronted by endemic and seeming epidemic conditions, I would very often do away with blood culture methods of making a diagnosis and declare my cases purely from the usual clinical symptoms and signs. The same regular line of treatment applied and, of course, with perfect results. In the variety of cases which I have had, a large number escaped or failed to develop intestinal lesions and this was particularly true with my early experiences in the handling of typhoid fever cases. I presume that the recognition of this fact years ago led me to differ with my superiors and with the manner I was taught—to believe that the disease was essentially an enteric fever. It is at such exigencies that blood culture diagnosis plays an important part, as well as with the exceptional cases which begin with angina, gastric catarrh, lobar pneumonia or intermittent fever. These conditions are well calculated to puzzle the clinician. The same condition of affairs are applied to the slight forms, to ataxic forms, with early delirium, meningitis or acute mania.

Candidly, I feel that there is absolutely no excuse for any confusion of typhoid fever with other protracted febrile conditions, as any simulating ailments, can be immediately differentiated through the serum reaction and blood culture findings, not to disregard, however, the bedside experience of rural physicians in properly determining such conditions by clinical symptoms.

Within the last years, typhoid has been pathologically regarded as a bacteriemia from the onset. It has not been so long that pathologists and bacteriologists have positively determined the condition not to be a hyperplasia of any special tissue, but rather a proliferation of the endothelium, rendering the circulatory apparatus the seat of the virulence of the toxins. As a matter of fact I have been theoretically in accord with these well-established facts years ago, as well as to be convinced that the disease not only presents lesions in the Peyer's patches of the terminal ileum, but as well in the solitary follicles of the cecum, causing a tendency to stasis and where the absorption of taxins are more pronounced.

Having had these facts in mind with all of my cases, my usual measures of treatments have been always properly instituted, special symptoms and complications handled as conditions would warrant, bringing about seeming marvelous results in the handling of typhoid fever cases, extending over a period of 18 years of practice.

What our health boards, hygienic experts and specialists tell us to do now regarding the preventive measures of typhoid, has been placed into execution by me all this time, and while it has always been a very hard matter to have some of the most essential points carried out in the rural districts, still I have met with little difficulty to intelligently apply the typhoid vaccine and with exceptionally good results from all angles. It has not been very long since I have used the first typhoid vaccine in the treatment of such cases, but it has been some time since I have ceased to use them. The theories advanced for its

efficaciousness are indeed disappointing to me. I have tried them in a variety of cases, but I have been unable to discover their merits. The same condition which applies to the various septicaemias is equally true with a system where there is already a bacteriemia. We are all familiar with the effects of serum on the other forms of infection and the one designated in the treatment of typhoid fever should be shelved.

REST, BALNEOTHERAPY, DIET, ELIMINATION, are the four real measures when properly instituted, form the fundamental principles of treatment. Rest is a measure which is universally practiced in all long and continued illness and occupies a very popular domain with the success of typhoid fever patients. It proves so beneficial in the latter stages of the disease, particularly when cases are threatened with intestinal hemorrhages, meningitis and other types of nervousness.

Balneotherapy has proven almost a specific with all my cases, irregardless at what stage of the disease and what complication arose. The trials which I have given this branch of treatment, I'm willing always to give it the fullest justice. A time-honored sympathizer of the Brand baths, I regret that the disadvantages which it affords by the results of poor nursing facilities in the country and for the further fact that patients are less disturbed and manipulated, which proves so detrimental during the advanced stages of the disease, by the shivering, shock and other untoward symptoms so common following tub baths, I have found the cold packs preferable.

The packs are usually applied in the form of a sheet wrung in cold water at a temperature ranging from 50 to 55 temperature, the patient immediately wrapped into this cold sheet and rewrapped in a dry sheet, blanket or counterpane and made to remain in this packing according to the temperature and reaction. In the event that a fall in the temperature is unnoticeable within a reasonable length of time, the same procedure is repeated. I never applied the cold packs unless the temperature exceeded 102° F., but when reduced to 100°, I'd remove them. During the course of the disease, I would invariably retain an ice cap to the head and in the interims of the packs, I always kept one over the abdomen. The abdominal ice bag largely minimizes tympanites and danger to intestinal hemorrhages and the head cap is very serviceable to control nervous manifestations. Balneotherapy must be commenced at the very incipiency of the disease and continued throughout its course. These packs are not only beneficial upon the symptoms of the present, but upon the symptoms of the future. They actually change severe types to moderate ones, lower the virulence of the bacillus, a powerful stimulant to the nervous system, the logical febrifuge, a powerful agent to combat the prostration common in typhoid fever. By its persistent uses, I have demonstrated the almost complete control of all nervous, digestive, cardiac, pulmonary and renal complications.

DIET in typhoid fever should be liberal and well regulated, consisting of easily assimilated foods, given at regular intervals. Nothing excels milk—pure fresh milk to which lime water is added. It's a splendid food, an excellent drink and a very good diuretic, but owing to its deficient caloric properties, it can not serve as a food alone and has to be combined with a variety of carbohydrates to lessen nitrogenous waste and combat the tendency to intestinal toxemia, which is always prevalent with stasis, particularly in the cecum. Combined with other foods, strained soups, mashed and baked potatoes, ice cream, strained vegetable soups, eggs in its different forms (soft boiled or the white of an egg raw, bread and butter, toast with cream), is the ideal diet, which will maintain the vitality of typhoid patients, thereby lessen the emaciation and general weakness which always follows.

Elimination, therefore, is very essential and under that head comes the medicaments which I have used and forms the only real drugs necessary in typhoid fever. Daily intestinal movement is the most essential point and this can usually be accomplished by a three dram dose of castor oil, to which 4 or 5 drops of turpentine are added. The same quantity of mineral oil with turpentine will do as well and are the

only means to overcome a too pronounced toxemia, thereby rendering the symptoms milder and the course of the disease shortened. Two or three pints of fresh water to which lactose, with citron and orange juices are added, should be drank in the 24 hours, as an abundance of fluid flushes the kidneys, stimulate diuresis, which is one of the best features in prognosis. As long as the kidneys are active, in spite of severe symptoms, I'm always satisfied for the poison is almost eliminated and severe complications are usually absent. With balneotherapy well and systematically applied, a proper diet given at regular hours, thorough elimination to be kept in mind, I have seldom seen the dry red tongue, sordes on teeth, tympanitic abdomen and a general condition of stupor. The classical picture of typhoid is markedly altered and the two great factors of intoxication and infection are practically conquered.

I wish it to be strictly understood that in my early years of practice, I have used many remedies in the treatment of typhoid fever. I used practically all of the intestinal antiseptics known to the pharmacopeia, I believed then in the non-nourishing diet and in the Elixir Alimentaire, which in those days and still among a certain class of physicians, occupied a prominent sphere in the treatment of typhoid, both as medicine and a nourishment. I believed also in the treatment of symptoms as they arose and not the disease and as a consequence I've had cases of typhoid to maintain temperature for weeks and sometimes months, although free from complications. I have the record of a young girl who kept a temperature ranging from 101° to 103° and 104° for 91 days, due, I am convinced, to the indiscriminate use of Ducro's Elixir—an agent when used in protracted febrile conditions, serves no other purpose but to add fuel to the fire. The complications which I had with my cases then were a few cases of delerium and several with intestinal hemorrhages and they too were promiscuously drugged with the usual nerve sedatives and intestinal astringents. I had a corresponding number of such complications since, extending, however, over a longer period of years, the regular routine of treatment only was instituted, the forms were milder and the results very much more satisfactory.

In conclusion, I wish to reiterate what I had to say in the beginning of this paper, and that is, I'm sure of not having brought out a point, new or difficult, which the ordinary practitioner, nor the specialist, are not familiar with, except perhaps the conception I always entertained since the early years of practice, differing as it were, with the first information I received on this all-important disease from the viewpoint of it being a special tissue infection. Said pathological comprehension induced me to do away with so many useless remedies, so unnecessary in the treatment of typhoid fever. The favorable symptoms and consequent recoveries, which all of my patients were so fortunate to reap, depended altogether upon the four cardinal points of treatment: *Rest, Balneotherapy, Diet, Elimination.* With such measures properly instituted, my patients were made able to fight for the perfect development of the agglutinins, which depends altogether upon bacteriolysis, setting free the endotoxins of the bacillus typhosus. In other words, my patients were able to develop their own immunity.

To accomplish all of this successfully every typhoid patient should receive the strict attention and surveillance of the attending physician. When danger threatens, do not thrust the responsibility of your case in the hands of another person. It's your property and it becomes a question of win or lose. Your visits should be frequent and regular, your instructions should be followed to the letter and if all such measures can be properly carried out, you may expect "One hundred per cent result in the treatments of Typhoid."

DISCUSSION.

Dr. J. Birney Guthrie (New Orleans): Dr. Couvillon referred twice to an egregious error in the teaching of the pathology of typhoid fever, I cannot remember whether I am responsible for part of the doctor's medical education, but I do know of one institution in this particular neighborhood where no such teaching has been in vogue for twenty years.

I feel the title of his paper is sensational—that his paper should be accompanied by a little more proof. It is rather inconceivable

to me that a man living in the country district of Louisiana should in eighteen years present a series of 154 cases of typhoid fever, all of which were confirmed by blood cultures. That is something that living and working next door to a laboratory we cannot accomplish. The difficulties connected with obtaining blood cultures are tremendous, and we all know the organism is recoverable from the blood only at a certain time in the early stages. So it seems to me a paper of this kind should be accompanied by more definite proof. We know men in the country can do wonderful work. The work of McKenzie, Jenner and others has shown us that we have to go to these men who see conditions frequently that do not come to us. Take for example malaria. What do we see or hear of malarial conditions? We have to look to you. But we work hard on our cases and we do not come here unless we have the data at hand on which we base our opinions, and I think it is incumbent on every man who presents a paper to give the data on which his conclusions are made. The fact that he lives in the country makes the obligation no less.

Dr. A. A. Herold (Shreveport): I wish to congratulate my good friend, not on his method of treatment, but upon his unusual success. I think a great many of us use about the same treatment.

I saw a case of typhoid fever not long ago, a severe case, that had been treated along these lines in a high class institution with a nurse in constant attendance, and although we tried to keep the toxemia down with mineral oil, balneotherapy, proper regulation of diet, complete rest, the man developed intestinal hemorrhage and died of dilated heart. Evidently the doctor has had something besides treatment in his favor. He has had luck with it, to show such good results.

He spoke of strained soups. If he had reference to meat broths I want to say that he is giving a food of very little value, but a very good culture medium for the intestinal tract. Otherwise I think his treatment is sane and rational.

Doctor Guthrie dwelt on the matter of confirming the diagnosis. We know that in the early days you can in many cases get the bacillus from culture. After that we have to depend upon the Widal reaction.

Dr. R. McG. Carruth (New Roads): Doctor Couvillon has contribute da very remarkable paper and I congratulate him as much upon his courage in coming here and telling us that he has had 100 per cent cures in typhoid fever, as I do upon the systematic manner in which he has brought together his points and elucidated the question.

It was Herbert Spencer who said something like this:: "If a man think he knows a thing and say it, whether he be right or wrong, it is well. For if he be right, the world, in time, will come to know with him the truth, whereas, if he be wrong, the world will show to him his error, and the world and he will have profited thereby."

But my percentage of cures has certainly been far different from his. I want to congratulate Doctor Couvillon also on finding out long ago that he failed to get results from Ducro's Elixir. I learned not to give this and various similar concoctions in typhoid fever many years ago, and I am sure my percentage of cures has possibly doubled since that time.

Doctor Couvillon spoke of balneotherapy, but I do not remember whether he included in that enteroclysis (injection of salt water into the intestinal canal), but that has been the treatment I have followed. I do not use the cold pack. My people do not like the cold bath, and I find better results from the warm bath in bringing down the temperature. I use a tepid saline injection every day.

Dr. S. J. Couvillon (closing): Answering Dr. Carruth, I wish to advise that what I mean with balneotherapy as one of the divisions of my line of treatment of typhoid fever, is hydrotherapy or treatment by cold applications and not saline injections as he understood. I wish to thank the Doctor and Doctor Herold for their kind discussions of my paper.

In reply to Dr. Guthrie, it is plain to understand that he did not follow the exact wordings of this paper. My cases in toto are 134, not 154. Perhaps the next 20 cases I will lose them all. Another point is that I did not say in the paper that all of my diagnoses were based on blood culture findings. I believe to have made it plain, that it was the most positive way to arrive at a diagnosis, but owing to the disadvantages we are confronted with in the rural districts, my diagnosis were more frequently arrived at by the usual clinical signs and symptoms and that with the proper lines of treatments instituted, I secured the results that I have stated. In doubtful cases, however, I invariably resorted to laboratory tests. Under such circumstances, it would be a physical impossibility to make the exhibit of my various diagnoses, as the doctor desired.

The same applies to the remarks of Dr. Bel. I had only 134 cases in eighteen years of practice and not 154, and that it was only when my cases presented a puzzling picture that I resorted to the laboratory, but not always.

TREATMENT OF TETANUS.*

By ARTHUR A. HEROLD, M. D., F. A. C. P.
Shreveport, La.

It is our purpose, in this article, to deal with the subject of tetanus, purely from the therapeutic standpoint. A more fitting title, perhaps, would have been "Rational Treatment of Tetanus" or "The Treatment of Tetanus Without Useless Frills," as we shall explain later. The writer is not one of that group fond of radical departures from accepted teachings, but he believes that, if a method in general vogue today seems irrational, it should be decried and protested against, in unequivocal

*Read Before the Louisiana State Medical Society Meeting April 24-26, 1923.

terms, even though it may have been accepted, without a murmur, from the day of Pasteur, John Hunter or even from Hippocrates!

At the last meeting of the American Medical Association, in St. Louis, Dr. Willard J. Stone of California read a most excellent paper on this subject, in which he submitted interesting statistics from both civil and military practice. When it came to the treatment of developed tetanus, he advised the usual procedures including antitetanic serum, intraspinally and intravenously. This method was freely seconded from the floor, until we had the temerity, in the face of what one might term the unanimous opinion of experts, to get up and say that we question the advisability of the use of serum in the spinal canal, on the ground that, when we consider the pathology of the disease, the treatment by the blood stream is the more rational and, in a limited number of cases, in my hands, has proven more beneficial, practically. My discussion, which, by the way, was not accurately reported in the published proceedings, was not received with sneers; on the other hand, I was told afterwards, by one of the participants, that my point of view "had a whole lot to it" and was well worth considering; the only reply on the floor was that experimental treatment, by Park and others, had pointed out that the intraspinal treatment, combined with intravenous, is the most beneficial.

First and foremost, it should be stated that the treatment of tetanus resembles, most markedly, the best therapy for certain mental conditions that we often encounter, in that the *real time to treat it is before it begins;* but, whereas, with this disease, the antedating usually is only seven to ten days, previously, in Neuro-Psychiatry, we must go back one or more generations, which makes it impracticable. But, seriously, if every case of what is called "potential tetanus", but which is, in reality, tetanus in the first stage, were to consult a physician and the physician were to exercise due caution, by not daring to take the chance of omitting prophylactic serum injection, we would not have cause for the discussion in this paper, today.

Unfortunately, though, a large number of these wounds do not come under a doctor's attention until the disease has reached what should be termed the second stage or, when the doctor does see the case early, he is sometimes careless or thoughtless and sometimes he thinks of the possibilities, but errs in judgment on the side of danger, instead of safety. I recall that, during my interneship in the New Orleans Charity Hospital, where the giving of tetanus antitoxin was a routine procedure in suspicious wounds, we had several cases to come back with tetanus; upon looking up the records, we found that the use of the antitoxin was neglected in all cases, except one, and this one patient had a very mild—or what might be called aborted—case of the disease.

Now, as to the rationale of the various ways of administering the specific antitoxin, for treatment of a case of what we say has reached the second stage. It has been administered around the wound, along the tracts of the nerves from the wound, subcutaneously, intravenously, intraspinally (subdural and bulbar injections). Undoubtedly, in addition to excision of focus, the use of serum, deeply into the tissues, is rational; attempts to block the passage of the toxin inside the nerve sheaths are sane, but are of doubtful efficacy inasmuch as we know that it travels up in intimate association with the axon itself; subcutaneous use for slow absorption, to fortify intravenous administration is very good, but the subcutaneous method, alone, in this stage, is not to be relied upon. When we come to discuss the intraspinal use of this irritating substance, let us stop and consider, for a few minutes, in what diseases, direct medication thus used, is beneficial, with the pathology of these ailments. In meningitis, especially the meningococcic form, where there is an active inflammation of the meninges, with the organisms demonstrable in the cerebrospinal fluid, the use of specific serum, early and in sufficient dosage, is indispensable. Next, we come to certain forms of spinal syphilis, in which direct specific medication was the vogue a few years ago; even though in this trouble, there is often meningeal involvement, the pendulum has swung back and I believe that I am justified in stating that a

methods of direct medication, as a routine, unless treatment by the more practical venous way, often supplemented by spinal drainage, should prove ineffectual. Now, with tetanus, it is universally accepted that the toxin reaches the central nervous system by way of the axis cylinders of the peripheral nerves and that, when it does get there, it is intimately bound up with the nerve tissue itself—and not causing a meningitis, at all. I have searched the literature to see if anyone has ever claimed to have found the bacillus tetani in the spinal fluid; the only thing approaching such a claim is that of Lacy & Murdock, in Journal of Laboratory & Clincal Medicine, where they report a case of tetanus, in which centrifugalized cerebro-spinal fluid revealed no organisms, but from which they claim to have isolated the germ from cultures; however, their work has not been confirmed, as far as we can learn, but, admitting that it is so, this case was probably an exceptional one. Now, then, except for this one instance, we have no evidence that the toxin is exerting its harmful effects anywhere except within the cord substance, itself; is it not reasonable and logical, therefore, to feel that there is better chance of reaching this substance through the vascular system than by bathing the cord in the antitoxin. There is a possibility that spinal puncture might prove beneficial, in conjunction with intravenous antitoxin, for, by relieving the pressure of the fluid on the outside of the cord, we enable the vessels within it to dilate to a sufficient extent to receive more of the antitoxin soaked blood.

Along this line, Dr. D. W. Kelly of Winnfield, reported a most stubborn case before this society last year, in which he finally won out by his persistence with the specific serum, subcutaneously and intravenously.

A brief report of one of my cases would not be amiss: P. W., colored, female, a cook, employed by my sister, came to me, in an emergency, with a large gash in the neck, inflicted by an otherwise harmless neighbor, while under the spell of the "green-eyed monster"; after cleansing, I sutured it and all went well till the tenth day, when she developed the usual muscular rigidity, trismus and headache; symptoms, however, were rather mild, so that I was loath to believe my suspicions; she was seen by three other men, who confirmed them, however. Ripping open the wound and treating with peroxide of hydrogen dressing, with one dose of 20,000 units of antitoxin, intravenously, was sufficient to effect a cure.

On the basis of the pathology referred to above, I contend that intraspinal antitetanic serum is unnecessary; that, if it is unnecessary, it is harmful, for the foreign material, including preservatives, are dangerous, to a limited extent, when so placed; that all the good that is claimed for this mode of administration can be accomplished by intravenous and sub-cutaneous methods, alone, if given early and in large enough doses; that spinal puncture is permissible for purposes of drainage, as above outlined, or for the use of magnesium sulphate, to control convulsions, according to the Meltzer method; that to bathe the spinal cord in antitetanic serum, hoping to cure the disease by this method alone is comparable to bathing the exterior of the body in castor oil for obstipation.

Now, having dealt with my specific point, I wish, before closing, simply to refer to the other measures, which should not be overlooked. If it has not already been done, get your surgeon to thoroughly extirpate the focus, if one is known. The patient should be kept isolated, in a darkened and quiet room, on a mattress not too soft; he should be handled very gently and not worried with too much treatment, other than the specific serum. If convulsions are slight, under above outlined care and he is able to obtain a moderate amount of sleep, drugs should be withheld; if, however, anorexia, convulsions, etc., disturb him, chloral, chloretone or morphine should be used, until he can be put under the influence of magnesium sulphate, used intraspinally or subcutaneously, or both ways. These things, however, are only symptomatic, to tide the patient over until nature effects the cure and the only way that we can aid nature, of course, is by giving antitetanic freely, early in the disease and

above all, by the methods by which it is effective.

DISCUSSION

Dr. J. G. Stulb (New Orleans, La.)—I fully agree with the doctor on the serum treatment for tetanus. The wound should not be laid open, but cleansed with soap and water and then antiseptic dressing, and then antitetanic serum given intravenously. The same treatment as you give malignant fistula or anthrax—wash the wound, but do not open up the fistula. Put on an antiseptic dressing and if you put your serum in intravenously you go right to the spot.

Dr. M. H. Foster (Alexandria): I have had no experience with the method employed for the purpose he is considering, but I want to offer this. I know definitely from the work we have done that it is now possible to empty the spinal canal early without a needle. Give 100cc of 15 per cent solution of sodium chloride, and the spinal canal begins to empty itself. This emptying is completed and the serum starts back at the end of six hours. Then give the serum again and you will have accomplished your drainage by eliminating the spinal fluid.

Dr. C. S. Holbrook (New Orleans): There has been a great deal of discussion between the intravenous and the intraspinous treatment for tetanus. The past few years intraspinous therapy has been enjoying greater favor and there seems to be a tendency from the literature to rely in tetanus on the intraspinous method, although not neglecting the intravenous. We fortunately have seen some results from the intraspinous treatment of tetanus that we could hardly expect from the older method.

I recently saw a case, a child of six or seven, who following a five-day incubation period developed a violent case of tetanus. The intravenous serum was used, given three injections on successive days intraspinously, and the child got well—a most violent case, and with such a short incubation period ordinarily the prognosis would have been extremely bad.

Another case, following abortion, incubation period of ten days, with violent symptoms—three doses of serum given intraspinously; practically no reaction of any consequence from intraspinous therapy, although large doses were given.

I feel so strongly in favor of intraspinous treatment combined with intravenous, that I should hesitate to treat a severe case any other way. I make it a practice to give a large dose, 10,000 to 20,000 units intraspinously every second day until they have three doses.

Dr. A. A. Herold (closing): Replying to Dr. Bel, I wish to say that I mentioned one case in which the authorities claim they found it in the canal, but that it had never been confirmed. I mentioned it, although it was against my argument.

Dr. Stulb speaks about the thorough cleansing, and, of course, that is necessary. I mentioned extirpation of the focus. We know that is very important. If it is a ragged finger or hand, just have the surgeon take it off.

Dr. Foster spoke about the hypertonic saline solution to drain out the spinal canal, but according to my argument I do not consider it is necessary to use that because I do not care whether the serum reaches the spinal canal or not.

Dr. Holbrook did not say how the serum put into the spinal canal reaches the interior of the cord and comes in contact with this toxin which is bound up there. I admit perhaps I am prejudiced, because the cases which I handled by the combined method unfortunately resulted fatally, and I have a suspicion that perhaps the irritating effect of the serum on the spinal canal may have had something to do with the unfortunate outcome.

My whole point was this—that there is a better chance for serum to reach the place where the toxin is by getting it into the blood stream; then if you want to make a spinal puncture and give the vessels a chance to expand to a certain extent and allow more of the antitoxin to reach the cord itself, do it with this end in view.

A CONCEPTION OF PSYCHO-NEUROSES AND SOME ERRORS TO BE AVOIDED IN THEIR DIAGNOSIS.

By E. McC. CONNELY.
Surgeon (R.) Usphs.

I wish to speak this morning in behalf of the step-children of Medicine, the most misunderstood, most abused. and, I think, the most neglected of all our cases, the psycho-neurotics.

In this group we are accustomed to place all members of that great family of so-called functional disorders, with the exception of the psychoses, but, up to a few years ago, having placed them there, we stopped. In speaking of them, medical works referred to "detecting hysteria" or like expressions which were a rather accurate reflection of the mental attitude of most physicians in regard to these cases. I think, however, that most of us have now reached a better understanding of these conditions and accord to them at least a portion of the sympathy to which they are entitled.

A psycho-neurosis is really a social disease, and not a physical one and is the expression of the individual's failure to adapt himself socially and is, in fact, an effort on his part to escape from reality, just as a psychosis is. But unlike most psychoses he does not have

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the mental deterioration and loss of insight to dull his suffering. On the contrary, he is keenly alert to every detail, and one of his most common obsessions is the fear of becoming insane.

His pain, unlike the physical suffering of organic disease, is mental and from it there is no escape for it occupies his entire consciousness. The usual things which afford momentary relief, or at least consolation, to a sufferer from organic trouble are denied him, if he summons his recollections of the past, they merely serve to remind him of what he might have been. The thoughtful attentions of his family accuse him of his failure and he reproaches himself for not providing for them as he should or not taking a normal interest, and so he goes on exaggerating his trouble appreciating his inefficiency and condemning himself for it, but powerless to resist. His family, his friends, and, too often, his physician regard him as a near maligners, or he thinks they do. They cannot understand his absurd resistance to all reason, why he persistently clings to silly ideas, admitting them as erroneous in one breath and taking them up again in the next. They do not see why he will lie in bed when there is nothing the matter with him. He is met on every side by assurances that he is perfectly well and he is adjured to "forget it". But he cannot forget it, and he goes on through life turning to first one thing and then another in an effort at sublimation.

Until recently, the advocates of the various schools were more or less intolerant of each other's ideas on this subject, and when a discussion of psychoneurosis took place, one wondered as to whether they were talking about the same condition or not. Of late, however, the lines have become less sharply defined and a more liberal attitude is prevalent, thus a psycho-analyst will consider a deranged function of the endocrine glands, the advocate of focal infections, may inquire as to a patient's dreams or the exponent of heredity may change the patient's environment. This is probably a result of our broadened knowledge having made it impossible for even the firmest adherents of the various schools to encompass all phases of a condition so complex by their own narrow creed. In short, we have come to see that we are not dealing with a single symptom or group of symptoms or yet with any one cross-section of a case, but with the case as a whole, and a very intricate and complex whole into which many things and many combinations of things may enter.

In considering a psychoneurosis we must look into: 1st the functioning of the various organic systems of the body—the cardio vascular, the respiratory, the digestive, the central nervous and especially the endocrines; 2nd, the general mental make-up of the patient, especially his emotional reaction; 3rd, his heredity, his past life, the experiences which may have rendered him sensitive to certain situations; 4th, his present life with especial reference to his habits—alcoholism, excessive work, etc.; 5th, his present situation in life, i. e., unhappy marital relations, distasteful occupation, uncongenial social environment, etc., and any one, or all, of these factors may play an important role in the etiology of the condition and must be thoroughly gone into before a complete understanding of the individual case can be arrived at. It makes very little difference whether the outward symptoms which have focused our attention on the individual be alcoholism, industrial inefficiency, or an emotional upset, or something else; we must locate the causative factor and treat it or else we have done little to help our patient to a permanent adjustment. I can best illustrate this by citing a case which came under my observation in a social way sometime ago. A young lady awakened one morning totally blind, her condition was properly diagnosed by an eminent optholmologist as hysteria. This opinion was concurred in by an equally prominent internist and together they treated the case by suggestion and, happily, the blindness disappeared in a comparatively short time. This was perfectly proper so far as it went for, of course, we must deal with symptoms in psycho-neuroses, as well as in other diseases, but they stopped there and making no effort to ascertain the underlying precipitating cause pronounced her cured. Yet something caused her blindness, and, not having been removed, it would seem logical to

suppose that she may have another attack manifested either by blindness or by some other symptom. The trouble was that they, and I am sorry to say, a large portion of practicing physicians, think of hysteria and other psycho-neuroses in terms of symptoms and not as disease entities. In physical ailments they go beneath the surface, and if a man has a pain in his side with temperature, etc., they are not satisfied with saying he has an appendicitis or a cholecystitis or what not—treating him until the acute symptoms disappear and pronouncing him cured—but they look for and treat the infected organ. In organic conditions they think of the disease as a whole, all the way from cause to end result, and the temperature of appendicitis is merely the red flag of danger and so they remove the infected appendix which is the real cause of the trouble. They do not think of hysteria in this way, therefore, the blindness constituted the entire condition and, it having disappeared, the patient was cured. The difficulty is that a psychic reaction may not be seen nor felt, nor can it be measured with a thermometer, and many able medical men do not think it worth considering as an active causative agent of disease. They look upon the subconscious mind as a vague nebulous thing of doubtful existence and do not regard it as a vast storehouse of past experiences, containing our own complexes together with the great mass of instincts which have gradually been accumulated through the ages and handed down to us by our ancestors. And still the influence of the subconscious mind may be so powerful as to produce blindness, paralyze the entire body or change the whole course of a life. They grasp at the more tangible symptom, appearing on the surface and, if they are successful in relieving that, are content. In doing this they leave the patient exposed to the danger of other attacks which may not, probably will not, be so easily relieved or will not be relieved at all and condemn him to wander from doctor to doctor or, worse still, from doctor to quack, dragging out a miserable existence of suffering and social inefficiency.

As I have said before, I feel that a great many factors are to be considered in the etiology of psycho-neuroses, but I believe a most important development towards a better understanding of these patients has been the introduction of psycho-pathology. Through it we are arriving at an appreciation of the tremendous influence the sub-conscious mind has upon the conscious life. With it we are able to look upon a psycho-neurosis as a disease entity and know that the various symptoms displayed, such as the paralysis of the hysteric, the irritability and agitation of an anxiety-neurosis are merely the danger signals by which we are warned. Just as the fever of an organic disease is a warning and while we must do just as we do in an organic disease and treat these symptoms as they arise, it would not do to let an alcoholic drink himself to death while we arrive at the cause of his trouble any more than it would do to let the fever of a physical case sap the vitality of a patient while we are making the diagnosis. We must go further, as we do in the physical case, and must not stop at the subsidence of acute symptoms. If we can arrive at this point of view and learn to recognize these men in the early stages of their disease, we may do much to relieve the suffering of the world and do more for our own reputation as physician. The specialist only sees these cases through the family physician and he is the man who must act promptly, for, unless taken early, the prognosis, serious at best, is well nigh hopeless.

I would impress the fact that a psycho-neurosis is a serious condition not to be considered lightly, which has to be handled with as much tact and judgment, if not more, than any other condition, if not taken early, before it has become chronic, is most difficult to palliate and well nigh impossible to cure. I believe I can illustrate the importance of an early diagnosis with a case which I now have under my care. This man, an anxiety neurosis, was referred to me some time ago by one of my colleagues. He happens to be an old college-mate of my own, and knowing him as I did then, I realize, with great force, how truly pitiable his present condition is. The neurosis dates back some twenty years, and he has gone from physician to physician, from quack to

quack; he has taken so-called psychological cures that he chanced to see advertised, spending everything he had and during that time only once before, about three years ago, has he seen a neurologist. To-day he is practically unable to do any work. He spends most of his time at his lodging in a dismal rooming house where he stays because he knows someone there who will sleep in the room with him and he dreads to be alone for fear of destroying himself. He has spells of agitation when he suffers intense agony. I found him in his room one very cold day last winter and he had not thought to light the stove. The most I can hope to do for this man is to relieve him to some slight degree, but had his family physician, twenty years ago, recognized his condition and advised him properly, he would have been spared not only the suffering that he has undergone, but he would probably be holding a responsible position, and leading a happy self-satisfied life at the present time.

It seems to me that the lay physician either does not consider psycho-neurosis at all or he looks upon the term as a mere diagnostic catch-all into which he may relegate all cases for whose symptoms he is unable to immediately locate an organic cause. There is as much danger and injustice to the patient in one extreme as there is in the other. We are all familiar with the fact that the mental attitude of the patient enters into most illnesses. Frequently this mental attitude is more difficult to treat than the disease itself. The diagnosis is not an easy matter, and at times it is most difficult to know just where the organic stops and the psychic begins. We must differentiate the primary neuroses, which are purely psychogenic in their origin, from the secondary neuroses which have some physical basis. Above all, must we differentiate the neurotic reactions engendered by physical ailments which clear up with the disappearance of the organic condition. The first step in making any diagnosis, is a thorough, complete physical examination. We must particularly eliminate lues, foci of infection, disturbances of endocrine function and diseases of the central nervous system. Having done this, we are in a position to look into the emotional reactions of the patient. We expect a psycho-neurotic to be absolutely sincere in his symptoms and to react to them with far greater emotion than a normal man would to similar pains. He magnifies them and builds them up and gives every indication of their being intensely real to him. The man who has a paralysis of his leg when in the hospital, but who can dance or play ball when he thinks himself unobserved is not a psycho-neurotic, nor is the man who one minute sits and tells of his feeling of unreality, of his inability to concentrate, etc., and the next discusses something else in a perfectly cheerful manner. The psycho-neurotic cannot get away from his trouble in this manner, it is always with him, he cannot forget it nor give it up no matter what he wants to do. A man with physical troubles, on the contrary, has periods in which his pains are, to a certain extent, relieved. He is also able to think of his condition and discuss it with more insight, and can take an interest in other things. Probably the most difficult type of cases to eliminate are the psychoses; especially those, such as Maniac, Depressive Insanity or Dementia Praecox, who display hypochrondriacal ideas. Their mental mechanisms are more or less similar to psycho-neuroses, their motives are similar, i. e., to escape reality. They are equally sincere, and, in early psychoses, there is often no way of establishing a diagnosis except by prolonged observation of the course of a case. Indeed, one of the most frequent types of case that we see are mild praecoxes, which have become arrested and who present little deterioration, masking under the guise of neurasthenia.

The limits of this paper have caused me to deal with psycho-neurosis in a rather summary manner. There are many important points that I have left untouched, but I have attempted to show that they are not to be taken lightly, that they should be looked upon as having a precipitating cause for their symptoms just as any disease has. That many factors are to be considered in their etiology, and if results are to be had from treatment, they must be recognized early and treated properly. Finally, the diagnoses is not to be made

without due consideration. They cannot be disregarded at all, nor yet can they be looked upon as a scape-goat if we wish to do justice to our patient.

DISCUSSION.

Dr. L. V. Lopez (New Orleans): The psycho-neurotic has been described recently by an essayist in the Journal of Psychiatry as being a safety-seeking individual whose first defenses have broken down. I think that is probably the best definition we have. In other words, the psycho-neurotic is an individual that, owing to his inefficiency in adjusting himself to any difficult situation, will seek some avenue of escape. He cannot face facts. He may develop symptoms without an organic basis, he may develop certain mental tendencies which if taken in time he can be sensitized, just the same as bacteriological infection. It may be a sexual subject, it may be an occupational subject.

Doctor Campbell in the same journal brought out the fact that a great many of us overlook helping these patients to get away from themselves. He gave an instance of a man who was a drug clerk, and his occupation became obnoxious. He never did care for it, but went into it to please his father. It was a long time before Dr. Campbell discovered this fact, but when it was discussed frankly with the patient he gave up the occupation and became a perfumery salesman. He had always been sensitive to odors as a child, and liked this occupation. Instead of advising him to give up his disagreeable occupation, Dr. Campbell was able to help this man continue as a useful individual.

Therefore the psychiatrist not only has to attack the problem as a medical man; attack the symptoms locally, but he must go further. It is true, as Dr. Connely has emphasized, that thorough physical examination, including the laboratory tests, is of primary importance in every case.

Dr. W. J. Otis (New Orleans): The reason these people are stigmatized is failure to understand the psychology of the normal and the abnormal. That to a large extent is the fault of the medical colleges, where insufficient time is given in the curriculum to the study of psychoneurosis and psychiatric conditions, and failure of hospital authorities to insist upon a compulsory neuro-psychiatric service; to the failure of the individual to receive proper attention, and to the failure to provide pavillions for the study of these people.

PRACTICAL POINTS ON THE SIGNS AND SYMPTOMS IN THE DIAGNOSIS OF EARLY PULMONARY TUBERCULOSIS.*

By EMILE A. BERTUCCI, M. D.
New Orleans, La.

In the field of tuberculosis there is nothing more helpful to both physician and patient than the diagnosis of the disease in its incipiency.

Phthisis being essentially a disease of intermittent course, presents a problem of great interest to the internist and to those who are especially interested in phthisiology—the very first symptoms are generally overlooked or passed up as a slight febrile disturbance or labelled some other condition, subsiding again without arousing suspicion; it is for this reason the disease has been allowed to take a firm hold on the individual and nearly always reaches a diagnosable stage by the time the physician is called in. The profession and the public should realize that the disease can be diagnosed in its very incipiency—given the needful skill. Following such diagnosis the physician sees the possibility of restoring a high percentage of his cases to a reasonable working capacity. The patient is at once aware of the fact that he has a terrific battle to fight, and yet, he will be grateful for the discovery of the disease while the prognosis is good. How is such skill to be acquired? Skill depends upon two factors—(1) the natural equipment both mental and manual of the physician, and (2) the amount of time he can devote to the acquirement of the technical dexterity and special knowledge needed to carry out delicate manipulations and to interpret the results—full mastering of the subtleties of physical examination is absolutely essential primarily.

However, full knowledge of the newer methods is also needed so that they can be used with profit. I refer to those methods which are so liable to misinterpretation, viz., the tuberculin tests and the X-ray, both valuable in their right places, but when knowledge of them is absent or imperfect they are liable to lead to fallacies. A febrile reaction to tuberculin, valuable though it may seem can be demonstrated in 50 per cent of the clinically sound: how striking are right apex phenomena, root shadows on a skiagram, fever after exercise, and the like—till their existence as part of the varying normal is brought fully into view. In these the absolute is wanting. Complete and thorough knowledges of the normal is needed, against which disease must be

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balanced and this more so with physical examination than with the special tests. However, I shall endeavor to present the practical points on the signs and symptoms of early tubercular disease in so far as these are of especial diagnostic value.

Before going into the physical signs it is necessary that one should acquire a certain definite knowledge of the very early symptoms which may lead to a suspicion of the disease. It is the essential first step in its diagnosis; secondly the early symptoms supply an answer more potent than all biological investigations, to the pertinent question, "Is the condition at the present time active?" It is through symptoms that suspicion is first aroused and the patient led to consult a physician, whose attention must be directed in the right channel. As Pottenger truly remarks, "the first and most important point in the diagnosis of phthisis is to know when to suspect it"; for in many cases we have symptoms that do not point to the chest as the center of disease, but attention is drawn into other channels, therefore, the physician must familiarize himself with the common symptoms and especially those most likely to lead him astray.

In the insidious cases there may be symptoms which are likely to carry the patient far into the disease before advice is sought, and to this class belong quite a few:

(1) Here we have the individual at the beginning who appears to be *constantly fatigued, run down,* and losing in weight, applies himself to tonics.

(2) There are a group of cases somewhat similar with *neurasthenic symptoms* where nervous depression, insomnia, and digestive disturbances are striking, but the underlying cause of which may be tuberculo-toxic in origin.

(3) Cases which develop an *anemia,* perhaps, which is the most striking symptom likely to lead to error. This is especially in young girls, therefore, no chlorotic patient should be passed over without examination of the lungs.

(4) *Dyspepsia* is common early in the disease which is often of a flatulent type associated with anorexia.

(5) *Fever and rapid pulse* may be first symptoms leading to disease, but tachycardia and palpitations on exertion may occur without fever or the pulse rapidity be out of all proportion to the thermometric change.

Any departure from the normal range of temperature must be held sufficient to demand an explanation, of which tuberculosis may or may not be the right one. There is no kind of fever distinctive of tuberculosis, but there are often certain elements about its temperature changes which are somewhat characteristic of the disease. What are these characteristic temperature changes? Instability of body temperature over slight causes as reading, writing, a game of cards, mental worry, a thunderstorm, and the like causing a slight rise, but perhaps the most common characteristic temperature reading which is met with in the very early stage, is a low morning temperature to 97° F. or under accompanied by a slight evening rise, the whole fluctuation being excessive. This condition may be accompanied by a pulse frequency out of proportion to the thermometric change. The importance of this increased swing of temperature as evidence of fever must be clearly recognized. Fishberg has remarked that "a patient with a temperature of 99.8° F. at 5 p. m. has not only 1° above normal when his morning temperature is 96.5°, but 3.3° above normal, and should be considered febrile." Another point, which has been remarked about the fever of tuberculosis, is the curious retention of appetite in its despite. One writer has declared that "all patients who eat and digest their food well, in spite of fever, are tubercular," and Fishberg remarks in support that "anorexia is a constant accompaniment of fever, excepting the fever of early tuberculosis," and he says this is also true in the differential diagnosis between pneumonia and acute pneumonic phthisis; "in pneumonia" he says, "anorexia is invariably complete, while in acute phthisis the appetite may be retained more or less, and in spite of a temperature of 103° F. or 104° F., the patient is apt to ask for nourishment."

Again normal temperature must not be taken as evidence of health, for early

phthisis may be afebrile, at least for a time but in such cases that the result of exercise, first suggested by Penzoldt, gives valuable infomation. However, before considering this we must know that there is a physiological rise of temperature due to exercise. How are we then to determine whether or not this rise is due to a tubercular focus Temperature in excess of the physiological rise is most likely indicative of toxins carried out from the tubercular focus into the bloodstream, whether mainly bacterial or, in part, produced by autolysis of the diseased tissues. A practical method to determine this fever test in any suspected case is to have a control who may be an attendant or nurse of known physical soundness, and the only requirement of the test is that the patient and control share whatever exercise or labour test decided upon, which may be a long brisk walk or some other active exercise. The temperature must be taken in rectum, for mouth temperatures are no criterion of the internal body heat. The difference in rise of the rectal temperatures becomes then the measure of the evidence of active disease in the case under observation. This test is especially valuable when the activity of a focus is in doubt or where a subcutaneous tubercular test has proven positive to small doses without corroboration from clinical signs. Where chronic disease is present, we must bear in mind, however, the possible effect of tolerance leading to a negative result. Apart from other proof of tubercle we must also bear in mind that fever obtained under these conditions is no specific test.

(6) *Laryngeal symptoms.* Ready tiring of voice, hoarseness and aphonia due to tubercular disease already planted in the lung but giving symptoms at an early stage in the larynx.

(7). *Pleurisy,* which forms, as a rule a striking picture, is one of the most important of the early symptoms of the disease, and the more delicate have our methods of investigation become, the higher is the percentage of idiopathic pleurisies proved to be tubercular. Jousset claimed to have found the tubercle bacillus in every one of 23 effusions investigated. Pleurisy is followed in a large number of cases by pulmonary disease. Now comes the question, in what manner does a tubercular pleurisy effect the parenchyma of the lung tissue? It must be remembered that the lymphatics of the pleura pass to the root glands which will be readily rendered tuberculous, because the normal lymph flow in the lung is from the periphery inwards to the root, the upper and middle parts of the lung draining into the tracheo-bronchial glands, as was demonstrated by Ghon, the middle and lower into the bifurcation glands, and thence to the tracheo-bronchial glands; now when tuberculosis of the lymphatic glands arise, the lymph flow becomes obstructed in several areas and this blocking of the lymph channels leads to distension and finally to a backward flow either directly, from in-competence of their valve, or indirectly, through the free anastomosis of lymph channels in the lung whereby the lymph is drawn outwards into neighboring systems. However, whichever way impelled, the tubercle bacilli travel outward from the glands toward the periphery with a fan-shaped distribution passing through the lymphatic walls as they go and, hence, starting peribronchial inflammatory changes.

The relationship of pleurisy and phthisis was thoroughly investigated by Allard and Koester. Among 2,123 cases of phthisis a history of idiopathic pleurisy was obtained in no fewer than 650. Again of 514 cases of pleurisy with effusion, followed up over a number of years, 47.7 per cent developed pulmonary tuberculosis. Even after dry pleurisy 42 per cent of cases developed lung disease. In patients developing pleurisy, between the ages of 31 and 35, 60.4 per cent afterwards suffered with phthisis. In most cases (85 per cent of the total) symptoms of lung disease develop within 5 years of the pleurisy.

Idiopathic pleurisy is strong evidence of tuberculosis in lung or gland or that the disease is not far away and it is necessary to keep such cases under close observation especially during the first five years following the attack.

(8). Another symptom which may mask a beginning tubercular condition in the lungs is a series of "colds" or *bronchitic scizures,* which may long obscure the diagnosis, but although the

possible varieties of cough are only characteristic to the trained ear, therefore, it is best not to presume that, even with experience, an examination of the chest can ever be safely omitted in any kind of a cough that lasts over three weeks.

(9). *Hemoptysis* or the spitting of blood as a possible early symptom is important to recognize. The fact that after the coughing and spitting of blood no further symptoms may appear for years, and yet, the disease be smouldering unsuspected. As there are a number of other diseases which may cause sputum to be blood streaked, I will only add that these other causes be excluded before reaching a conclusion as to whether it be of tubercular or non-tubercular origin. Lord, among, 1,381 post mortems at the Massachusetts General Hospital, found 15 cases where a hemoptysis without subsequent illness had occured at some time in their past. In 14 of these, pulmonary tuberculosis was found to have been the cause, and the fifteenth was due to syphilis. It is, then, of the utmost importance that with a free hemoptysis (other causes being excluded) phthisis should be presumed, and the patient be treated for this disease until the risk of extension can be definitely excluded.

And now having arrived at a conclusion from symptoms to a suspicion of tuberculosis infection we now pass on to some of the practical points on the physical signs of early tubercular disease.

First Inspection:—I am not going to go into the ordinary detail of inspection but only intend to touch upon those points which are liable to be found in the diagnosis of very early stages of the disease.

(1). Fix the apex of the heart and exclude any organic disease of this organ before passing on to the lungs.

(2). *Asymmetry*—Under this I wish to mention that in 50 per cent of 1st stage cases there will be noted that on the affected side the point of the shoulder and nipple are lower than the other side, the nipple smaller and seems to lie farther back. Behind, the scapula at the lower inferior angle may reach 3 inches below that of its fellow and different distances from the spine, i. e., nearer the spine, muscular atrophy of a little of the pectorals but more of the upper part of the trapezius. The superior border of that muscle instead of running straight from the neck to the shoulder, is flattened wasted, and hollowed out so that, as compared with the opposite side, much less of it shows above the clavicle when viewed from the front, and above the spine of the scapula, when viewed from behind. This is more marked in men than in women. As to causation, the sign is pretty certainly tuberculo-toxic in origin. The characteristic unilateral trapezius atrophy strongly suggests that the weakening of the muscle in the upper part causes the corresponding half of shoulder girdle to sag with the weight of the arm known as *"drop shoulder."* The natural inferiority of the left side has nothing to do with it, for the right trapezius is oftener affected than the left agreeably with the fact that the right lung is more frequently tuberculous. Pottenger, like Fischer, describes a spasm of the muscle overlying a tubercular apex due to reflex irritation by nerve paths. This sign has a great practical, value, clean, objective, and definite.

Palpation and Vocal Resonance.....

It is but seldom of real value in the diagnosis of early apical tuberculosis.

Percussion.....

Up to the year 1875 there was an "era of heavy percussion." but after this, C. A. Ewald recommended the very lightest percussion (Schwellemvert perkussion) for outlining cardiac dulness. I, personally, am in favor of the light percussion stroke because it is based on the physical law that the smaller the stimulus the slighter will be the change, in which it can be sensed, so that the note over dull areas was practically absent, and the difference between this "nothing" and resonance is more readily detected by the ear when between resonances of different amount. Here again the skill of percussion and the determination of the pitch and quality of the percussion note depends again largely on the acute and acoustive qualities of the auditory apparatus to distinguish the difference in musical tones, since the percussion sounds are of complex musical nature, it depends upon

the particular musical qualifications of the percussor, whereas, one may be able to recognize the difference in a full tone or semi-tone ordinarily, so the one who is particularly versed in musical adaptivness may recognize even a quarter tone difference between notes. On very many cases, a change of percussion note preceeds any ausculatory evidence of disease and is less open to other interpretation than are the changes in breath sounds which represent the earliest ausculatory signs.

In percussing we must at first mark out Krónig's area of resonance at the two apices, known as Krónig's isthmus, and the earliest changes consist in a blurring of the outlines of resonance. This may occur on both outer and inner side, but commonly, the inner side most markedly at first. These changes may precede ausculatory signs and also symptoms such as cough and expectoration.

In percussing the rest of the lungs, we must bear in mind that the note above the level of the second rib is normally of higher pitch than that over the chest below, and in percussing up the back, that the note normally rises in pitch from the base up, but so gradually as to produce no striking changes from point to point. Again, a somewhat puzzling, but not uncommon, discovery in comparing the two lungs in phthisis is a contrast impairment on one side in front, but on the opposite side behind, what has generally been referred to as "crossed dulness". This depends on a compensatory hyperinflation or "relaxation" over one surface of the diseased lung, which becomes dull in front and hyper-resonant behind, or vice versa. The hyperresonant note gives a false impression that the opposite lung is dull, and thus a doubt appears as to which is the diseased side, a doubt which other signs will, as a rule, dispel.

Since tuberculous processes tend to first appear, or at any rate reach the surface, in the neighborhood of the apex of the lung, it is upon this area that attention must be concentrated in the detection of the earliest evidences of disease.

Krónig's Isthmus in health is normally 5 cm. (2 inches) across, and should not fall below 4 cm. in extent, such as found in persons of sedentary occupation,—clerks, tailors, and the like, and also in those of small stature. Apices of 3 1-2 cm. or below are decidedly pathological.

Topographical percussion is especially valuable in detecting the presence of old and healed disease. It furnishes incontrovertible evidence of the presence of deep lung changes, whether active or arrested, in cases of "central" diseases, such as hilus tuberculosis, before the process has yet reached at any point the surface of the chest. The physical examination of a difficult and doubtful case of chest disease is not complete without the comparison of Krónig's areas of resonance.

Percussion then supplies us with the following information:

(1). The resonant areas are equal and of normal extent: evidence of healthy lungs.

(2). The areas are of normal measurement, but one is displaced in position: a condition described by Krónig under the name of "physiological heterotopia".

(3). There may be a blurring of one or other, or both margins of the resonant area with or without some general loss of resonance: a condition suggestive of early phthisis.

(4). A difference in the width of the isthmus on the two sides may be discovered.

Unilateral expansion of Krónig's area may be due to compensatory emphysema, and when this is bilateral there may be slight widening of the isthmus. Unilateral retraction may be due to tubercular changes, recent or remote, or to collapse either passing or more permanent or to induration, the result of collapse. Bilateral narrowing is characteristic of hilus tuberculosis but may also be brought about by fibrosis, due to inhalation of dust.

In this country, D. B. Lees has been the exponent of percussion and has called attention to the value of systematic mapping out of the chest. W. Ewart also agrees that percussion signs precede ausculatory in phthisis, except in the catarrhal form of invasion. Though accomplishment in auscultation must not be neglected, yet there is little

doubt that gentle percussion, too little practiced hitherto, is the easier to master of the two methods, and yields more certain and fruitful results.

Auscultation

In the diagnosis of very early tubercular disease through auscultatory signs there are (1) Breath sounds, and (2) Adventitious sounds.

In regard to breath sounds,—Dr. James Jackson Jr., of Boston in the year 1833, while a student in Paris, communicated to the Societé Medical d'Observation, a paper on the prolongation of the expiratory sound as an important sign of the early stages of phthisis. But since then Dr. W. F. Dutton, whose article appears in the Medical Record in 1922, claims that 90 per cent of the cases of pulmonary tuberculosis can be detected before the usual stereotyped signs and symptoms become recognizable. He found in an observation of 20,000 cases a condition not previously observed and described in text-books which was for a while puzzling, but on close observation the sound was found to exist only in one condition,--pulmonary tuberculosis. The sound is one which is only heard on *inspiration* and is the sound of a fine wood-plane often varying in pitch between that of a wood-plane on soft pine and a soft rasping, continuous or alternating through the entire period of inspiration but *not* usually heard on expiration. The sound is heard best in second and third intercostal spaces anteriorly, on the side affected, between the sternal line and the midclavicular line, and is produced by the abrasion of lung tissue or infiltration on the external surface or in the parenchyma of the lung and does not affect the voice sounds, but only the breath sounds of inspiration, and which is known as the *inspiratory sound.* It is found to be confirmed in 90 per cent of the cases which were diagnosed incipient tuberculosis. From my personal observation of 200 cases, I found this sign to be present in between 90 and 95 per cent of cases which were confirmed by x-ray, and the tuberculin tests, and which presented the clinical symptoms as follows:

(1). Chronic fatigue with slight evening rise of temperature, slight loss of weight, with little or no cough,—70 per cent.

(2). Loss of weight, slight cough, anemia,—20 per cent.

(3). Dyspepsia, flatulated type, with anorexia,—10 per cent.

It is the sound of great diagnostic value. The normal inspiratory sound is a soft blowing murmur except over the right apex, in which inspiration is higher pitched, and somewhat louder. I do not attach much attention to the so-called interrupted, broken, or cog-wheel inspiration, as much error is likely to be made in so far as we find such conditions in cardiac excitement, or the effect on the neuro-muscular mechanism of nervousness or cold.

Harsh breathing is not a sign of phthisis, but occurs where there is compensatory over-activity in the healthier lung, or over a healed focus, and is of the type of puerile breathing, a sound normally heard over the lungs of children.

In the interpretation of the abnormal respiratory sounds, two points must come out for investigation:—

(1). Are they strictly localized to a small area of lung tissue?

(2). Are they present at the same spot on more than one examination?

If they do not fill these requirements their significance vanishes, so it may be said that any anomalous form of respiration fixed and confined to the summit of the lung suffices for a provisional diagnosis of phthisis.

To recapitulate:

(1). Examine inspiration and expiration separately, directing especial attention to the former.

(2) Having discovered an abnormality consider the following points:

(a) Can it be only a physiological difference between the two sides?

(b). Is it heard over a wide area or strictly localized?

(c). Is its localization related to an area where tubercle commonly appears?

(d). Is its localization persistent; does it remain on more than one examination?

(e). Is it supported by evidence from the sources, such as impairment to gentle percussion?

Adventitious sounds or Rales:—If adventitious sounds are present during quiet breathing, the case is no longer early, but I will just pass on with a very few remarks in regard to this stage of the disease. What is known as the "alarm area," described by St. Chauvet, is a spot that lies midway on a line drawn from the space between the 7th cervical and 1st dorsal spinous processes to the tubercle found on the spine of the scapula about the junction of its inner and middle thirds. Emile Sergent noted the first physical signs at this spot in 68 per cent of cases. Again infiltration of the lower lobe at a point opposite the 5th dorsal spine, Fowler claims a very valuable aid in diagnosis, and infiltration at this point coincident with signs at the apex, is almost positive proof of tubercular disease of the lung. Especially characteristic in early stages, are a few, perhaps three or four, sticky crackles at the end of inspiration, only present after a cough and with deep breathing, but if present in large numbers and during quiet breathing the case is no longer early.

The significance of adventitious sounds in phthisis depends less on their character than on their persistent localization to a particular area of the chest, and on their predilection for the apex of the lung. Isolated involvement of the apex of the lower lobe is a valuable confirmatory sign if found, but it is but rarely present. Remember that non-consonating rales or one or both apices, only stand for catarrh, and are, by themselves, no justification for a diagnosis of phthisis.

In closing it might be apropos to suggest that thus far our facilities for study of clinical tuberculosis have been inadequate. Let us with a better understanding of the infection, promulgate new ideas, let us open our hospitals to the tuberculous and give the young man an opportunity to study the disease. Let us avail ourselves of the opportunity which the large clinical material now offers and we will all become more proficient in the early diagnosis of tuberculosis.

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EDITORIALS

FOREWORD.

Your new committee has assumed direction of the publication and management of the Journal through the Secretary-Treasurer, who has been made General Manager.

At the first meeting, this action being confirmed at a subsequent meeting, the American Medical Association was promptly notified that we would adopt the advertising policy under which practically all of the successful medical journals of the country are now operating. In the future no advertisement will be accepted for the pages of the Journal that does not meet the requirements of the Journal of the American Medical Association. Those advertisements now running in the Journal will be discontinued as soon as the contracts can be terminated. This insures a Journal of the highest type and one which we hope will merit and receive the cordial support of every physician in Louisiana. We further hope that in due time every physician in Louisiana who is qualified will become a member of the State Medical Society.

The purpose of the Journal is to assist the Medical Society to unify the profession of the State toward further realization of its standards and ever-increasing excellence of service. The means to this end will be the organization of a medical society in every parish and through these societies to reach every man or woman who proposes to practice medicine in Louisiana; also to endeavor to exclude those unworthy. When this standard shall be attained all practitioners will be fully and thoroughly equipped for the great responsibility laid upon them.

MALARIA MUST BE ELIMINATED.

It has been clearly demonstrated that where there are no mosquitoes there is no malaria. We know the source of malarial fever and its possible remedy. Too many of us have noted its results in desolated homes, broken constitutions and lingering sickness. It is our duty to try to shape public opinion, to teach that private and public action conjoined in time will bring a new order, and to press the matter till all the resources of the popular will, fully apprehensive of the danger and the remedy, combine to work out the desired results.

Reports from an industrial institution in Louisiana where the payroll numbers four thousand show that during June there were seventy cases among these employees, causing an average loss of eight days, or a total of 560 days for one

month, which the management recognizes as unnecessary and preventable.

It would cost the parish authorities five thousand dollars, the State Board of Health providing a like amount, to put on an all-time health department which would insure an all-time health officer, a visiting nurse, a sanitary inspector and a clerical assistant. The loss in one month to the industrial concern above mentioned would almost pay half of the expenses of the parish for the all-time health department for one year. This health department would conduct campaigns for the control of communicable diseases (which includes Malaria), eradication of soil pollution, child welfare work including medical inspection of school children and education in hygiene.

We, therefore, ask the members of the medical profession throughout the State to enter during the current year upon the investigation and discussion of this subject in such a way as to fully convince our people that our mission is not only to heal the maladies of the body, but to shape and determine means that may prevent them.

A HOME FOR PHYSICIANS.

The movement inaugurated by the former President of the State Medical Society, Dr. Paul J. Gelpi, to establish a home for some of the faithful physicians whose lives were spent in gleaning in barren fields seems to be striking a popular chord.

Dr. Gelpi has started a movement which should be taken up and carried to completion. It means that a home owned and supported by the Medical Society shall be erected where congenial surroundings could be provided for the superannuated of our profession. As endowment legacies and contributions come in, provision could be made for instruction and comfort of the orphans and physicians and for the care of the widowed where advancing years otherwise lone and cheerless could be brightened and the sorrows of life more readily borne.

MORE REPORTING FOR DOCTORS.

Acting on the suggestion of the House of Delegates of the State Medical Society at the recent meeting in New Orleans, the State Board of Health has added to the Sanitary Code Article 511, which reads: "Physicians and midwives shall report congenital deformities with the name of parents and address." The originator of this idea was Dr. Truman W. Brophy of Chicago, who enjoys the distinction of being one of the leading oral-dental surgeons of the world, and is noted for his success in the correction of deformities of the mouth.

Many children come into the world with harelip, club foot and other deformities which, if brought to the attention of the institutions of the State, might be corrected and the child instead of being crippled and deformed could be trained to a life of usefulness—an asset instead of a liability to the community. It is for this reason that physicians are urged to make prompt reports of all congenital defects with the hope, where the parents are not financially able to provide the necessary attention, that arrangements can be made for treatment of the child in some institution of the State.

MEDICAL PROGRESS.

Every little while something will come up that will make us pause and ask ourselves if we are really making any progress in a medical line—meaning, of course, all branches of medicine and surgery. It is true that many supposedly valuable discoveries or inventions have not had the "staying power," that we are still groping in the dark, more or less, on the cancer problem; that no one has yet definitely isolated and described the causative organisms of variola, measles, acute anterior poliomyelitis and other acute diseases; but, on the other hand, we should stop to consider the strides made in preventive medicine, in surgery, in pharmacology, in endocrinology, in the past decade.

We should remember that many new things are over-rated at first, so that the pendulum swings back too far after the first trials; then the remedy or method assumes its real position, midway, as it were,placed there by the conservative element in our profession.

Many radical innovations are acclaimed too soon, especially by the laity and the lay press. We remember how,

only a few years ago, the country became excited over Friedman and his turtle-bacillus treatment of tuberculosis; the then Secretary of State of the United States honored him with his presence at his clinic in New York. Again, we have but recently heard much of the "Abrams' method of diagnosis and treatment," shrewdly advertised and many honest men fell for it; it has now been exposed in both lay and medical press. Such things as these really serve to impede medical progress, regardless of whether they are intended as frauds, are put out with honest intentions or are simply premature attempts on what might some day be real valuable contributions to our therapeutic armamentarium.

Again, too often do we have really valuable contributions hurt by promising too much for them by the lay writers. We had a glaring example of this only recently in the write-ups of Banting and Best's wonderful work in producing insulin; some newspapers and magazines gave out the impression that we now have a certain and sure cure for all diabetics; of course medical men, who were informed, could promptly explain this misinformation away, but, unfortunately, these reports had some of the doctors misled, too.

All these things should be considered in estimating our "Medical Progress." The fact remains, however, that we are going steadily forward, in spite of occasional backsets and the Journal confidently looks forward to better and better work in solving our riddles; we are optimists and believe that each decade will be an improvement over the previous one in this respect.

AN APPEAL FOR INFORMATION ON MATERNAL WELFARE .

The Committee on Maternal Welfare of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons is anxious to procure accurate information as to the progress which each State is making in the matter of Maternal Welfare in order to formulate a report for our annual meeting in Philadelphia, in September.

A preliminary programme was published in the issue of the American Journal of Obstetrics and Gynecology for June, 1923, which it is hoped may be a suggestion of an outline for national work among all organizations which have a common basic line of endeavor, including Medical Societies, Departments of Health and Commissions of Social Workers.

We shall be under many obligations if you will be kind enough to send at your early convenience a brief synopsis of the results accomplished in your State and most important if possible a contrast of the record of the clinics or regions where patients have been privileged to have pre-natal care with the statistics of the community in general where no supervision has been afforded the prospective mothers.

These it is planned to have incorporated into the completed survey to be presented to the Association and to be published in the Annual Transactions later on.

DR. HENRY SCHWARZ,
St. Louis.
DR. GEORGE W. KOSMAK,
New York City.
DR. GEORGE CLARK MOSHER,
Chairman, Kansas City.

ANNUAL REPORT OF THE RETIRING PRESIDENT

By DR. W. H. BLOCK
New Orleans.

It is prescribed by our by-laws that at the expiration of his term the retiring President shall give an account of his stewardship during his term of office, but if you have listened attentively to the reports of the various officers you will agree with me that there is little left for me to report. However, there are a few outstanding features of the term of 1922 that might bear repeating.

Our meetings during the year have been well attended, the average attenance, 125, which would seem to indicate that, at least they were interesting. We have had two special meetings which deserve special mention, one was our Lewis night, the other Pasteur night. "Lewis night" was in celebration of the 60th anniversary of the entrance into the medical field of our own dearly beloved Dr. Ernest Sidney Lewis. It was, indeed, a great pleasure to thus honor him, who stands among us as the nestor, commanding the respect and deserving the love of all his fellow practitioners. Long may he continue to live among us, is the urgent prayer of your humble servant.

The Pasteur meeting was an event of the year and seemed to be thoroughly enjoyed by all present. Every phase of the subject was covered by various speakers and the evening was one long to be remembered by those who attended and appreciate the position of Lewis Pasteur in the history of the world.

Many new books have been added to our library during the year and yet we can never have enough. We have tried to supply the demand as it came, but with our limited means we have done the best we could. I wish to commend the librarian and his assistant upon their faithful and diligent attention to the affairs of the library.

During the year there has been added to our library a separate reading room at a considerable expense. Reports from the office and from individual members would seem to indicate that it was a wise expenditure of funds. Many members have taken advantage of and enjoyed the comforts of this new reading room.

Our office has been improved by the purchase of new desks and chairs so that at the present time it is well equipped and convenient to carry on efficiently the work of the society.

The finances of the society are in excellent condition. By that I mean that you do not have to worry much about meeting our actual expenses. What we must worry about is to find more money to maintain and improve our library. The librarian has told you that he has spent approximately $1,900 this year; $1,000 of which came from the 1921 funds and $900 of the funds of 1922, plus the salary of the librarian, makes a total of about $2,700 spent for the library during this year. This, of course, is a rather small amount to maintain a library the size of ours, about 9,500 volumes and 150 journals, and it is, therefore, a problem to find more funds for this purpose. During the year the Board of Directors established a Library Endowment Fund, into which was placed some funds of the society which had been saved from the interest on our capital of $30,000. Some of this was in Liberty Bonds bearing 4 and 4 1-2 per cent interest. These bonds were converted into first class 6 per cent bonds as recommended to us by the bank so that we have a Library Endowment Fund now of approximately $3,500 bearing 6 per cent interest. It is desirable to increase this fund as quickly as possible in order to establish a steady and fixed income for this one purpose only.

The membership of the society has increased by fifteen during the year. This is somewhat of a disappointment to me. I urged in my inaugural address a strenuous campaign to get into the society men who are not members and who are good material. There are many of them, there are about 600 doctors in New Orleans and we have a membership to-day of 448. This means that we must be more diligent in the build-

*Read before the Installation Meeting, Orleans Parish Medical Society, Jan. 8, 1923.

ing up of our membership in the interest of organized medicine.

I would like to suggest a few changes.

Our method of electing candidates is not satisfactory. The procedure at present is, the application is posted for thirty days, it is then considered by the Board of Directors who make their recommendation to the society and the candidate is then balloted on. This latter has proven to be a cumbersome and inconvenient procedure. I suggest that the by-laws be amended so as to give the power to elect candidates for membership in this society to the Board of Directors after the usual procedure of posting for thirty days.

I believe that the Judiciary Committee should be given more freedom to act. As at present constituted it is for all practical purposes nothing but a reference committee. It takes up nothing but what is referred to it officially. I believe that the Chairman of this committee should be given power to, and it should be made his duty to take up with his committee and consider and investigate anything that may come to his notice, in whatever manner, that smacks the least bit of unethical conduct on the part of any member of the society.

The Treasurer of this society has been a most faithful and efficient officer and I have frequently wondered what would happen had we not had so efficient a man in that affair. I am forced to the conclusion that the position, at present, is overloaded with responsibility, for the reason that we now have quite a large fund to be manipulated, expended, invested, and budgeted and I firmly believe that this duty shauld fall not upon the treasurer, but upon a finance committee. With this in view, I strongly recommend the creation of a Finance Committee, whose duty it shall be to recommend to the society the proper disposition of its funds and to establish a definite budget. This committee to be one of our standing committees appointed annually by the President.

In closing, permit me to express my deep sense of gratitude for the co-operation that has been accorded me by the members and the officers of the society and by the office force during my term of office. It has been a pleasure to work with them and it is just such harmonious work on the part of all concerned that makes for the betterment of our society. Especially do I wish to mention the work of our Secretary. She has been ever diligent, faithful, and attentive, always striving for the best interests of the organization. I trust that such interest and enthusiasm will continue.

In conclusion, I wish to say that, while, to-night, I lay down the gavel to be taken up by my successor, I am still a member, a member in the ranks where I have worked for fifteen years, always with pleasure and an earnest desire to build up, and I propose to again take up my former status and continue my efforts on behalf of the Orleans Parish Medical Society.

INAUGURAL ADDRESS OF PRESIDENT.*

By H. W. KOSTMAYER, M. D.

New Orleans.

There occur to me three excuses for talking to you to-night: First, custom demands it; second, there might be something new to present; and third, it might seem desirable to bring before you matters not new, but of considerable importance. Unfortunately, nothing new has been presented, yet I do not wish my remarks to fall altogether in the category of "custom demands," so I needs must burden you with what I deem important, if more or less familiar.

The affairs of Charity Hospital are not directly those of the Orleans Parish Medical Society, yet the two institutions are so interdependent that the following considerations seem not inappropriate.

For the first time in the history of Charity Hospital the Visiting Staff is in absolute control of the medical affairs of that great institution. This would mean the prompt advancement of the Hospital to a place second to none of its kind in this country were it not for limited money and the overhanging shadow of possible change through political influence. Through concerted effort appropriations have been raised to the limit of the State's resources. However, little effort has been made to re-

*Read before the Installation Meeting, Orleans Parish Medical Society, Jan. 8, 1923.

duce expense, and practically no sustained attempt has been made to remove the Hospital from State politics. Both ends might be attained if this organization sponsored the movements with sufficient vigor.

It is doubtful if there could be instituted more economical methods than those in vogue at present in the Hospital. The trouble is, the Hospital serves by far too many. It has long been the boast of this community that Charity Hospital asks no questions, but serves rich and poor alike. Think what folly this boast contains! The daily average number of resident patients is about 885 at a daily per capita cost of $1.60. I am convinced that this daily average should be reduced by at least 100, a daily saving of $160, and a yearly saving of $57,000! Apply this same principle to the outpatient department and it is readily discernible how much more efficient the Hospital could become for those actually entitled to its benefits. In this matter we certainly should not stop at Charity Hospital, but we should regulate the charity done by each and every medical and surgical institution in the city. This not simply to increase the income of the profession, which it most certainly would do, naturally, but primarily to protect the worthy and needy poor against the impositions of the unscrupulous well-to-do. Social Service seems the logical stepping stone to this end, but the Hospital Abuse Committee may devise more direct means. Without the undivided support of this body all efforts of this committee will come to naught. We earnestly ask your serious consideration of this age-old problem and especially assign its active development to the Hospital Abuse Committee.

The necessity for removing Charity Hospital from politics hardly needs to be dwelt on. It has been talked of at intervals since the Civil War. Hardly does it seem possible that an institution devoted to the care of sick and injured should be looked upon as political spoil, and the positions growing out of its activities as plums to be dished out to those who did most to elect a Governor, without any reference to special fitness or general hospital efficiency. And yet this has always been so and will be so to the end unless the profession takes a firm united stand against it. There are several simple legal means of bringing this about. None can succeed, except through the efforts of organized medicine—none could fail, if organized medicine became a unit in forcefully demanding its accomplishment. To the Committee on State Legislation we assign this problem, but it is the problem of each and every member which can be solved only by an absolutely united profession. The new administration feels that it will have justified its existence if it can but add momentum to these projects. How irresistible this momentum may become depends on the profession —in a word, on organization.

To anticipate the criticism that this is purely a hospital affair, I would remind you that the two institutions are closely dependent on each other. Furthermore, this problem is my hobby, and I have taken advantage of the opportunity to tell you about it.

As for the Orleans Parish Medical Society directly, I feel that in most matters I'll be better prepared to talk to you a year hence. However, this much is certain; Scientific programs should be made as attractive as possible in order to bring out large gatherings. To this end, careful consideration has been given to choosing the Scientific Essays Committee. In the final analysis, success in this direction depends on the membership. The administration, therefore, earnestly beseeches each and every one to remember all that this Society means to the profession, and to make regular attendance a part of the obligation of membership.

For the finances of the Society we have modest ambitions: To budget within the revenues and to live within the budget; and to add to the building fund, if ever so little, in order to establish the precedent that part of our annual income must go to increasing this fund against the time when we shall again possess our own home.

Assuming the duties of this office to-night gives me great pleasure and arouses no little pride. I am pleased because it seems but a short while (now that the years are gone) since I first entered the ranks of members, and I am proud (pardonably, I hope) because this

office is the greatest gift the medical profession of New Orleans can bestow. Feeling thus, I can not find words to express my gratitude and appreciation. I do sincerely and heartily thank you for the honor you have done me. Right or wrong, successful or otherwise, you may rest assured I will always be doing my utmost to prove worthy of your confidence.

REPORT OF THE SECRETARY FOR 1922.*

To the Officers and Members, Orleans Parish Medical Society:

It is my pleasure and privilege, as Secretary of the Society for the year 1922, to render a brief report of the principal activities. These have been many and varied. Several of the reports will probably be covered more thoroughly by the respective chairmen of the Standing and Special Committees.

The strength and stimulus of any scientific body, as you know, is judged by the character of its meetings, and it is with considerable pride that I refer to the splendid meetings we have had during the year.

Of the twenty general meetings, thirteen were for the purpose of listening to scientific papers; two were joint clinical meetings with the Charity Hospital Staff; three were the regular quarterly executive meetings (held in accordance with the by-laws), and two were special meetings. The latter were called for the purpose of discussing and taking action on the proposed legislation relative to the Physicians' Occupational Tax. In connection with this, I might say that, although our efforts were not entirely successful in this matter, some pressure was brought to bear and it is believed that in due time the physicians' demands will be recognized and the tax either modified or abolished.

Above one hundred and twenty-five (125) numbered the attendance at the regular meetings, against ninety (90) as reported last year, with the exception of "Lewis' Night," at which practically three-fourths of the membership was present. The executive meetings showed an attendance of more than twice that of last year.

*Read Before the Installation Meeting, Orleans Parish Medical Society, Jan. 8, 1923.

Thirty-two (32) papers were read during the year, the subjects being distributed as follows: Medicine, Surgery, Gynecology, Obstetrics, Laryngology, Pediatrics, Radiology, Pathology, Urology and Chemistry. Of the thirty-two (32) papers read during the year, five yere by invited guests.

Early in the year we listened to two excellent papers on "Warfare Gases" by Lieut. Col. Gilchrist. These papers were extensively illustrated both with still and moving pictures. One of the meetings was called at the request of several members to hear a paper on "Twilight Sleep" by Dr. Bertha Van Hoosen, of Chicago. This meeting was well attended and the paper was illustrated with charts and lantern slides.

The papers read by our own members represented much thought and work and some of them, tedious research—such papers are valuable additions to the scientific contributions of the Society. The evening of April 24th, affectionately known as "Lewis Night," at which Dr. Ernest Sidney Lewis read a paper entitled "Reminiscences," will ever stand out in the minds of the present membership as having been one of the happiest, most delightful and enthusiastic and entertaining meetings in the history of the Society, at no other of the members, certainly never a more time has there been a larger attendance beautiful demonstration of love and united interest for a man or a subject. As a fitting climax to this memorable evening, a silver loving cup, tendered by members of the Orleans Parish Medical Society, was presented to Dr. Lewis.

The men who so generously and ably contributed to "Pasteur Night," placed this Society on a footing with the best in the country, and to them we owe a debt of gratitude.

Twelve regular meetings were held by the Board of Directors and special meeting, which was called to consider some communications which had come to the Society in reference to advertisements which appeared in the local papers concerning some members of the Society.

One of the important steps taken by the Board, early in the year, was to have the Liberty Bonds of the Domicile Fund registered. Another important

action of the Board was that of creating a Library Endowment Fund, making provision for a nucleus, at least, for the Library in the future. Unsuccessful effort was made by the Board to secure, through the House of Delegates of the Louisiana State Medical Society, the balance left from the Entertainment Fund of the American Medical Association Meeting. We were successful, however, in acquiring through the influence of one of our members, a sufficient amount to purchase a multigraph and an addressograph for the office.

The Society is fortunate in having obtained, through the generosity of the Board of Administrators and the School of Medicine of Tulane University, additional space for the Library. A quiet Reading Room is now available for all members.

The influence of the Society in the community has been repeatedly demonstrated by the many communications received from various medical, civic and other oganizations, requesting information, suggestions and frequently advice.

During the year several communications were referred to the Committee on State Medicine and Legislation. This committee responded promptly to all requests.

One member asked for Medical Defense. This request was investigated by the proper committee and forwarded to the Medical Defense Committee of the Louisiana State Medical Society.

Several matters of importance were referred to, and investigated by, the Judiciary Committee. These matters were handled with discretion and tact and the finding of the committee were accepted and filed.

The Membership Committee was abolished by an amendment to the by-laws. The duties of this committee is now referred to the Board of Directors, except that at the conclusion of the investigation of an applicant, they report their recommendations in writing to the general society, at a regular meeting, and the applicant is voted upon by secret ballot.

we close the year 1922 with a membership of 448, distribted as follows:

Active Members	412
Associate Members	20
Honorary Members	16
Resigned	2
Moved from city	4
Dropped (delinquency)	4
Loss by death (3 active, 2 honorary)	5

Total new members, 1922, were 29 (28 active, 1 associate).

In addition, there are 13 applications pending.

The Secretary, who is or should be conversant with the most intricate workings of the Society, would not justify the trust imposed if, after a year's work (and in my case two years of service) she did not have some suggestions to offer for the advancement and betterment of the organization.

I would, therefore, like to make the following suggestions:

Firstly: At present is it difficult to get other than an approximate number of members who actually attend the meetings. Would it not be interesting to know the exact number

Secondly: An essayist is limited, according to the by-laws, to fifteen minutes for the presentation of a paper. To conform to this regulation many valuable points are frequently overlooked or often intentionally left out of the body of the paper with the anticipation that said points of interest will be brought out in the general discussion that follows. Such details and stenographic work as is essential should not be expected of the Secretary. Several methods have been tried, none being entirely satisfactory. It seems to me the work should be delegated to an experienced person.

Thirdly: With the present arrangement regarding meetings of different character, we are unable to anticipate more than twelve or thirteen evenings for scientific sessions, unless s pecial dates are arranged. Would it not be possible to use the summer months for clinical meetings in the various hospitals and reserve the cooler months for scientific meetings?

Fourthly: The officers of the Society are all busy practitioners in one line or another; they are not trained for, nor do they desire to do detail work such as is necessary in an organization of this kind. My experience has taught me that, at present, the greatest need of the

Society is a thoroughly competent and experienced Assistant Secretary.

In conclusion, I wish to thank the President and each member of the Board of Directors for their most helpful suggestions and every hearty cooperation. To the general membership I haven't words to tell you how very gratified I am over the appreciation you have shown by the attendance at the meetings and the quick response to the many efforts we have tried to put forth in behalf of the Society.

I wish to thank the various committees for their promptness and assistance in handling the various matters referred to them.

Our greatest success throughout the year revolves around the Scientific Meetings, and this success has been due solely to the conscientiousness of the Chairman and Members of the Scientific Essays Committee.

I finally desire to thank the help in the general office for their many efforts in carrying out the work allotted them.

Respectfully,

ELIZABETH BASS, M. D.,
Secretary.

REPORT OF RESOURCES ON HAND JANUARY 1, 1923.

Domicile Fund, Liberty Bonds, par value	$30,000.00
Library Endowment Fund, Bonds, par value	3,500.00
Library Endowment Fund, Savings Account	1.23
Medical Relief Fund, Savings Account	92.88
Petty Cash Account, balance on hand	4.28
Library Fund, checking account	373.92
General Fund, checking account	409.43
Total resources	$34,381.76

REPORT OF THE GENERAL FUND.

January 1, 1922, to January 1, 1923.

Balance on hand January 1, 1922	$ 101.43
Total receipts, including balance January 1, 1922	8,074.70
Total expenditures	$7,848.77
Actual book balance January 1, 1923	$ 225.93

REPORT OF LIBRARY FUND.

Bank balance January 1, 1922	$ 481.85
Receipts during 1922	5,518.07
Total amount of fund	$5,999.92
Expenditures	$5,798.10
January 1, 1923, bank balance	373.92
Checks outstanding	172.10
Actual book balance, January 1, 1923	$ 201.82

PROCEEDINGS OF HOTEL DIEU STAFF

JUNE, 1923.

The President, Dr. Homer Dupuy, in the Chair.

A PECULIAR CASE OF ECTOPIC GESTATION.

Dr. E. W. Walet presented what he considered unusual symptoms in a case of Ectopic Gestation as follows: Amenorrhoea three months, no vaginal bleeding, was seized with acute and severe girdle pain in lower abdomen, attended by nausea, and was vomiting. Family doctor made diagnosis of acute appendicitis and sent to Charity Hospital. Pelvic examination revealed uterus about normal in size and a mass the size of a lemon to left of uterus, D. & C. revealed clean decidual membrane, Laparotomy revealed a Rt. tubal pregnancy about three months' duration to which was attached the vermiform appendix. Right tube and ovary and appendix removed.

Dr. H. E. Nelson—The unusual feature of this case was the absence of bleeding per vaginum. Most cases bleed profusely.

Dr. J. A. Danna—Why was a curettage done. Is it not true that there is very often a second extra uterine on opposite side? Did Dr. Walet make an attempt to save ovary on that side? Why did he not attempt to save right ovary? I do very few curettages.

Dr. M. Couret—I believe the procedure of curetting the uterus in suspected extra-uterine cases advisable because it tells immediately the diagnosis. I have never seen an ovarian pregnancy and do not think it exists. The ovary should not be removed in these cases.

Dr. Walet, closing: I did a curettage purely for curiosity. My case was not absolutely certain. It was the only thing to explain all this woman had. I simply did a little dilatation. I did this to see if I could find my diagnosis. No real reason for going in abdomen, explored for the sake of palpable mass. It was a time for a decidual recurrence. I believe there is such a thing microscopically speaking as ovarian pregnancy because if it happens to rest there, why not take it on to ovary. The reason I removed the ovary, because when you open a cavity like that and the pelvis is filled with blood, the technique is to go down and remove the mass. You hold the mass with the hand and pull it out. You remove the mass containing the extra-uterine tube and ovary. The tube was ruptured and filled with placental remains. It was removed because it was a mass and not worth while saving. Dr. Levy asked about the microscopical report. It is a general rule that when a patient is shocked that you operate immediately. The operation itself is comparatively so simple that you do not shock your patient much. No reason why could not have tubal pregnancy on both sides.

NEWS AND COMMENT

The City Council of New Orleans, on Tuesday, finally passed the ordinance to accept the donation of Mrs. Dibert for the construction of the Tuberculosis Hospital. The location of same to be in the Seventh Ward of the city. This has been under consideration for several years and its final disposition is looked upon with favor by the public, and especially medical men of the City and State.

Charity Hospital Appeal is receiving another boost in the form of a baseball contest to be indulged in by the Visiting Staff versus the House Staff and Intern Staff of the Charity Hospital. The contest gives all outward appearances of being one of keen rivalry, and promises lively entertainment to all those having attended.

The Delegates and Members of the Louisiana State Medical Society in attendance at the American Medical Association Meeting held in San Francisco have nearly all returned and report a very interesting and profitable meeting. Some still remain in the West visiting medical centers and otherwise enjoying awell-earned rest and vacation.

It is with a great deal of pride that we note that some of our members received notes of distinction. Dr. Amedee Granger received a prize, and was especially commended for the Scientific Exhibit in Radiology. Dr. Urban Maes was honored with the Chairmanship of the Surgical Section of the American Medical Association for 1923-24.

The following physicians have returned and resumed practice after absence from the city for rest or study: Drs. G. C. Antony, J. C. Hardy, J. H. Landrum, A. M. Peters, R. O. Simmons, R. B. Wallace, and J. L. Wilson. Still absent: Drs. E. I. Gandy, J. I. Peters, Clarence Pierson, G. M. G. Stafford and J. A. White.

The Avoyelles Parish Medical Society met at Dr. Philip Jeansonne's residence, Plaucheville, Thursday, June 14th, at 7 p. m. An interesting clinical programme was discussed, preceded by a magnificent banquet served by Mrs. Jeansonne, assisted by a half dozen of the fair damsels of the village.

Dr. G. R. Beridon, President, in th chair.

The following members answered th roll call: Drs. Beridon, S. J. Couvillo Ducote, Roy, Jeansonne, Chatelai Poret, Quirk, Matthews, Buck; absen tees, Fox, Plauche, W. F. Couvillo Barbin, Lafargue, Tarleton, Jones, d Nux. Guest, Dr. Will Buck of Kinde The minutes of the Hessmer, April 19t meeting were read and adopted.

Dr. S. J. Couvillon and Dr. R. C Ducote reported a very interesting cas of Placenta Praveia. The discussion b the various members proved lengthe and interesting.

Drs. Jeansonne and Roy reported a series of successful emergency opera tions for suppurating appendiciti which were performed in privat homes. The patients are all being pre pared for radical operations later.

Dr. Roy reported an interesting cas of toxemia of pregnancy and in the dis cussions Dr. Matthews pointed out th necessity of a thorough and complet quantitative urinalysis. In connectio Dr. Couvillon described a case of cho lecystitis complicating pregnancy, wit kidneys in good condition and that as a last resort transduodenal lavages wer instituted, establishing a miraculou relief and that 90 days later patien gave birth to a full term child witho any further complication.

Owing to unavoidable reasons, Dr W. F. Couvillon, essayist on a "repor of a few unsuccessful cases," was un able to present his paper.

By Dr. Chatelain, that a vote o thanks be tendered Dr. and Mrs. Jean sonne for their genial hospitality an banquet tendered the society, and a amendment by Dr. Couvillon, that th Avoyelles Parish Medical Society mee in the different villages of the paris hereafter and that the expense of en tertainment be borne by the local pro fession.

Bunkie was selected as the next meet ing place on Thurdsay, August 14th 1923, at 7 p. m. Dr. E. Stanley Ma thews will present a paper on "Burns and Dr. Kirby A. Roy will open discus sion.